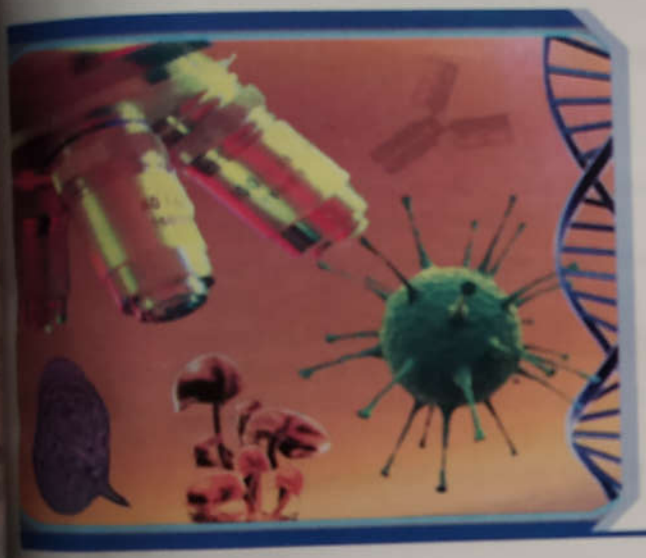


MICROBIOLOGY

General Microbiology — Questions

1. **Microorganism used as weapon in biological terrorism is?**
   a. Smallpox virus
   b. Rabies virus
   c. Influenza virus
   d. Human parvovirus

2. **Disease transmitted by blood transfusion are all except**
   a. Syphilis
   b. AIDS
   c. Malaria
   d. Histoplasmosis

3. **True about sterilization is:**
   a. Spores are destroyed by drying
   b. Soiled dressing is sterilized by hot air oven
   c. Surgical instruments are sterilized by boiling
   d. Vaccines sterilized by filtration

4. **The following statements regarding bacterial spores are correct except**
   a. Are formed under adverse environmental conditions
   b. Are resistant to boiling
   c. Contain multiple layers
   d. Are formed primarily by the organisms of genus Streptococcus.

5. **The chemical nature of capsule may be**
   a. Polysaccharide
   b. Polypeptide
   c. Both of the above
   d. None of the above

6. **Most important surface active disinfectants are**
   a. Anionic
   b. Cationic
   c. Non-ionic
   d. Amphoteric compounds.

7. **The purpose of staining cells on a microscope slide is to:**
   a. Kill them
   b. Secure them to the slide
   c. Enlarge the cells
   d. Add contrast in order to see them better
   e. See motility

8. **A microbiologist inoculates Staphylococcus epidermidis and Escherichia coli into a culture medium. Following incubation, only E. coli grows in culture. What is the most likely explanation?**
   a. The microbiologist used too much inoculum
   b. The culture is contaminated
   c. The incubation temperature was incorrect
   d. The culture medium must be selective
   e. The culture medium must be differential

9. **You are observing a cell through a microscope and note it has no apparent nucleus. You conclude that it most likely:**
   a. Has a peptidoglycan cell wall
   b. Has a cellulose cell wall
   c. Moves by pseudopods
   d. Is part of a multicellular animal
   e. None of the above

10. **Koch's Postulates are criteria used to establish that:**
    a. Microbes are found on dust particles
    b. A specific microbe is the cause of a specific disease
    c. Life forms can only arise from preexisting life forms
    d. A specific microbe should be classified in a specific kingdom
    e. Microbes can be used to clean up toxic spills

1. a	2. d	3. d	4. d	5. c	6. b	7. d	8. d	9. a	10. b

11. All microorganisms are best defined as organisms that:

a. Cause human disease
b. Lack a nucleus
c. Are infectious particles
d. Are too small to be seen with the unaided eye
e. Can only be found growing in laboratories

12. Which is true for endotoxins?

a. Highly antigenic
b. Found only in Gram-negative bacteria
c. Usually binds to specific cellular receptors
d. Highly toxic and fatal in microgram quantities
e. Toxoids are used to immunize

13. Which subunit of the exotoxin is the binding portion of the molecule?

a. A b. B
c. C d. D
e. E

14. Most Gram-negative bacteria have a lipopolysaccharide (LPS) which is found in the

a. plasma membrane
b. Cell wall
c. Inner membrane
d. Outer membrane
e. Periplasmic space

15. Probiotics exhibit all BUT the following characteristics:

a. Nontoxic and nonpathogenic to host
b. Have beneficial effect on host
c. Mimic antibiotics
d. Remain viable for a long time
e. Withstand acidic nature of host's stomach

16. The following statement is true

a. Blood cultures should be collected when the patient spikes a fever
b. Blood cultures should be collected after the patient spikes a fever
c. Blood cultures should be collected before the patient spikes a fever
d. Timing of blood culture collection need not coincide with fever spikes

17. Phenol is bactericidal at a concentration of

a. 0.1% b. 0.25 %
c. 0.5 % d. 1 %

18. Which of the following is the most ideal disinfectant for preparation of skin prior to insertion of a central venous catheter

a. Povidone iodine and alcohol
b. 0.4% w/v chlorhexidine
c. 2% w/v chlorhexidine
d. Chlorhexidine and cetrimide

19. Bowie Dick test is used to assess

a. The efficiency of a steam sterilizer
b. The performance of steam sterilizer
c. The efficiency of a hot air oven
d. The efficiency of a hot air oven

20. The spore of the following is used as biological indicator to monitor steam sterilizer

a. Geobacillus stearothermophilus
b. Bacillus subtilis subsp niger
c. Bacillus cereus
d. Bacillus anthrax

21. The following phenomenon is responsible for antibiotic resistance in bacteria due to slime production

a. Enzymatic degradation
b. Biofilm formation
c. Mutation resulting in altered target site for antibiotics

22. Universal/Standard precaution should be applied to all except

a. Serum b. Semen
c. Synovial fluid d. Sputum
e. None of the above

23. The first thing to do in case of accidental occupational exposure to blood and body fluids

a. Wash with plenty of soap and running water
b. Put the affected area in your mouth
c. Squeeze blood from the area
d. Apply bleach or 1% Sodium hypochlorite on the affected area

11. d	12. b	13. b	14. d	15. d	16. d	17. d	18. c	19. b	20. a
21. d	22. e	23. a							

24. How should endoscopes be disinfected

a. Manual cleaning, disinfecting, rinsing
b. Manual cleaning and autoclaving
c. 70% alcohol and rinsing
d. Sonication and rinsing

25. In a post operative care unit, five patients developed post operative wound infection on the same wound. The best method to prevent cross infection occurring in other patients in the same ward is to

a. Give antibiotics to all other patients in the ward
b. Fumigate the ward
c. Disinfect the ward with sodium hypochlorite
d. Practice proper hand washing

26. Endoscopes have been known to be contaminated with the following organism due to poor quality of rinse water

a. Mycobacterium chelonae
b. Mycobacterium tuberculosis
c. Mycobacterium xenopi
d. Mycobacterium bovis

27. Peptidoglycan synthesis occurs in 4 phases. Cross linking of polypeptide chains occurs in:

a. Phase 1 b. Phase 2
c. Phase 3 d. Phase 4

28. What is the structure that is found in gram negative but not in gram positive bacteria

a. Cell wall
b. Cytoplasmic membrane
c. Flagella
d. Outer membrane

29. Exotoxins are

a. Lipopolysaccharide in Nature
b. Produced by Gram –ve bacilli
c. Highly antigenic
d. Very stable & resistant to chemicals

30. A soldier developed thigh abscess following gunshot injuries during an anti insurgency combing operation. Gram stain of the foul smelling exudates revealed plenty of pus cells and a mixed flora of Gram positive and Gram negative rods. However aerobic culture was sterile. Which of the following enzymes is most likely involved in the following reaction: $2O^{2-} + 2H^{+} = H_2O_2 + O_2$

a. Catalase
b. Oxygen permease
c. Peroxidase
d. Superoxide dismutase

31. On GASPAK two types of bacteria was isolated. Biochemical studies revealed that these bacteria failed to produce superoxide dismutase, catalase and peroxidase. All are incorrect except

a. Aminoglycoside antibiotics is the drug of choice
b. Less virulent than the ones containing all the three enzymes
c. The enzymes are expressed in the reduced state
d. They have enzymes only for the EMP pathway

32. All are true regarding disinfectants except

a. Glutaraldehyde is sporicidal
b. Hypochlorites are virucidal
c. Ethylene glycol is intermediate disinfectant
d. Phenol usually requires organic matter to act

33. Endoscopes have been known to be contaminated with the following organism due to poor quality of rinse water

a. Mycobacterium chelonae
b. Mycobacterium tuberculosis
c. Mycobacterium xenopi
d. Mycobacterium bovis

34. Which of the following is used for biological monitoring of gas plasma sterilizer

a. Bacillus subtilis subspecies globigi
b. Bacillus pumilus
c. Bacillus subtilis subspecies niger
d. Bacillus stearothermophilus

24. a	25. d	26. a	27. d	28. d	29. c	30. d	31. d	32. d	33. a
34. d									

35. The best way to prevent contamination of the PCR process is

a. Use of biosafety cabinet
b. Internal sterilizing agent such as uracil N-glycosyls (UNG)
c. Use universal precautions
d. Clean the area with 1% sodium hypochlorite

36. The best molecular typing method is

a. PFGE
b. RFLP
c. Ribotyping
d. Spoligotyping

37. All except one are contributions of Robert Koch to the field of microbiology.

a. Germ theory of disease.
b. Discovery of Vibrio cholerae.
c. Discovery of staining technique.
d. Discovery of staining of bacteria.
e. Discovery of solid media.

38. Paul Ehrlich is known for its contribution to microbiology in the field of

a. Discovery of prontosil as antibacterial.
b. Discovery of gene splicing
c. Theories on immunity.
d. Theories of antibody production.
e. Theories of DNA synthesis

39. Peptidoglycan synthesis occurs in 4 phases. Cross linking of polypeptide chains occurs in:

a. Phase 1
b. Phase 2
c. Phase 3
d. Phase 4
e. End of phase 3

40. Sedimentation coefficient of bacterial ribosomes is:

a. 70S
b. 60S
c. 80S
d. 90S
e. 100S

41. Biocides are substances that

a. Kill only pathogenic microorganisms
b. Kill all living microorganisms excluding spores
c. Kills all living microorganisms including spores
d. Prevent growth of pathogenic bacteria
e. Prevent growth of nonpathogenic bacteria

42. Chemical agents that destroy the microorganisms by interfering with membrane functions are:

a. Formic acid
b. Hydrogen peroxide
c. Formaldehyde
d. Phenol
e. Ethylene oxide

43. Not true about drug resistance mechanism?

a. Most common mechanism is production of neutralizing substances
b. If resistance is plasmid mediated, it is always transferred vertically
c. Alteration of target in pneumococcal resistance
d. Complete removal of target is cause of resistance to vancomycin

44. All of the following are required in PCR except

a. Deoxyribonucleotides
b. Thermostable enzyme/DNA polymerase
c. Dideoxy ribonucleotides
d. Magnesium/ssdna/Template DNA

45. Penicillin is extracted from:

a. Penicillium chrysogenum
b. Penicillium notatum
c. Aspergillus niger
d. Yeast

46. Which of the following statements are true regarding flagella? (PGI)

a. It is made up of smaller units called flagellin.
b. Bacteria with polar flagella move very fast
c. Antibodies to flagella are protective.
d. Basal body is anchored in cytoplasm.
e. All flagella essentially have same chemical composition.

35. b	36. a	37. a	38. c	39. d	40. a	41. c	42. d	43. b	44. c
45. a	46. a,b,e								

47. **Lysogenic conversion is seen in the following (PGI)**
   a. C. diphtheriae
   b. Salmonella
   c. Staphylococcus
   d. Vibrio
   e. Clostridium botulinum.

48. **Which of the following are examples of basic dyes used to stain bacteria: (PGI)**
   a. Crystal violet
   b. Methylene blue
   c. Nigrosin
   d. Safranin
   e. Malachite green

49. **Molecular technique used to study expression of gene is**
   a. Polymerase Chain Reaction
   b. Real time PCR
   c. Ligase chain reaction
   d. Microarray using gene CHIP
   e. Gene splicing

50. **Following statements are true regarding real time PCR (PGI)**
   a. Uses Fluorescent probe for detection of amplified product
   b. Post amplification manipulation is required.
   c. Cycle is very long
   d. Risk of release of amplified product into environment less
   e. Quantification cannot be done

51. **Mycin is: (PGI)**
   a. Bactericidal antimicrobial
   b. Effective against Gram positive bacteria
   c. Effective against Gram negative bacteria
   d. Useful in treatment of pneumonia.
   e. Active even during stationary phase of growth cycle

52. **Which of the following is/are examples of live vaccines?**
   a. Japanese encephalitis.
   b. Influenza virus
   c. Oral typhoid vaccine.
   d. Acellular pertusis vaccine
   e. BCG vaccine

53. **Following statements are true regarding external quality assurance (EQA): (PGI)**
   a. Establish intra laboratory performance
   b. Ensure reliability of future testing.
   c. Ensure credibility of the laboratory
   d. Retrospective periodic assessment
   e. Establish interlaboratory comparability

54. **Ortho-phthaldehyde has following advantages over glutaraldehyde: (PGI)**
   a. Nonirritant
   b. Does not stain skin
   c. Odourless
   d. Poor material compatability
   e. No advantage over glutaraldehyde

55. **Which of the following statement is true?**
   a. Solid media are enrichment media
   b. Nutrient broth is basal media
   c. Agar adds nutrient to media
   d. Chocolate agar is selective media

56. **Which of the following is most resistant to antiseptics?**
   a. Spore
   b. Prion
   c. Cyst
   d. Fungus

57. **A chest physician performs bronchoscopy in the procedure room of the outpatient department. To make the instrument safe for use in the next patient waiting outside, the most appropriate method to disinfect the endoscope is by:**
   a. 70% alcohol for 5 min
   b. 2% glutaraldehyde for 20 min
   c. 2% formaldehyde for 10 min
   d. 1% sodium hypochlorite for 15 min

58. **Heat labile instruments for use in surgical procedure can be best sterilized by:**
   a. Absolute alcohol
   b. 2% glutaraldehyde for 2 hrs
   c. Chlorine releasing compounds
   d. Ethylene oxide gas

47. a,b,e	48. a, b,d,e	49. d	50. a,d	51. a,b,c	52. c	53. b,c,d,e	54. a,c	55. b
56. b	57. b	58. d						

59. All are true regarding disinfectants except: (PGI)

a. Glutaraldehyde is sporicidal
b. Hypochlorites are virucidal
c. Ethylene oxide is intermediate disinfectant
d. Phenol usually requires organic matter to act

60. The operating temperature in an ethylene oxide sterilization during warm cycle is:

a. 20-35°C b. 49-63°C
c. 68-88°C d. 92-110°C

61. The sterilization method for catgut suture:

a. Steam b. Radiation
c. Boiling d. Burning

62. Choose the correct ones for the decreasing order of resistance to sterilization:

a. Prions, bacterial spores, bacteria
b. Bacterial spores, bacteria, Prions
c. Bacteria, Prions, bacterial spores
d. Prions, Bacteria, bacterial spores
e. Bacterial spores, prions, bacteria

63. Sterilizing agents include: (PGI)

a. Dry heat b. Ethylene oxide
c. Ether d. Alcohol
e. Chlorohexidine

64. Which of the following can be reliably used for hand washing: (PGI)

a. Chlorhexidine
b. Isopropyl alcohol
c. Lysol
d. Cresol
e. Glutaraldehyde

65. Sporicidal agents are: (PGI)

a. Glutaraldehyde b. Ethylene oxide
c. Formaldehyde d. Ether

66. Radiation can be used to sterilize all except:

a. Bone graft
b. Suture
c. Bronchoscope
d. Artificial tissue graft

67. Sputum disinfection is done by all except:

a. Autoclaving b. Cresol
c. Boiling d. Chlorhexidine

68. Which of the following is most resistant to the action of antiseptics and disinfectants:

a. Spores b. Coccidia
c. Prions d. Mycobacteria

69. The indicator used in autoclave is:

a. Clostridium tetani
b. Geobacillus stearothermophilus
c. Bacillus pumilis
d. Bacillus subtilis var niger

70. Which is used in digestion and decontamination of sputum in smear preparation:

a. NaOH b. KOH
c. NaCI d. KCl

71. Which of the following are used for sterilization of surgical instrument:

a. Ethylene oxide
b. Gamma radiation
c. Autoclaving
d. Glutaraldehyde
e. Hot air oven
f. All the above

72. The disposable plastic syringes are best sterilized by:

a. Formaldehyde b. Ethylene oxide
c. Hexachloride d. UV radiation

73. Autoclaving is done in :

a. Dry air at 121 °C and 15 lb pressure
b. Steam at 100°C for 30 minutes
c. Steam at 121 °C for 15 minutes, 15 lb pressure
d. Dry air at 160°C for 30 minutes

74. Culture media are sterilized by :

a. Autoclaving b. Radiation
c. Hot air oven d. Tyndallisation

75. Glassware and syringes are sterilized by:

a. Autoclave
b. Hot air oven
c. Ethylene oxide
d. Irradiation

59. c,d	60. b	61. b	62. a	63. a,b	64. a,b	65. a,b,c	66. c	67. d	68. c
69. b	70. a	71. f	72. b	73. c	74. a	75. b			

76. Asepsis means:
a. Absence of pathogenic microbes
b. Disinfection of the surface
c. Prevention of infection
d. Destroying all forms of microorganism

77. MacConkey's Agar medium is:
a. Enriched medium
b. Enrichment medium
c. Differential medium
d. Synthetic medium

78. Gamma radiations are used for sterilizing:
a. Plastic Syringes
b. Cystoscopes
c. Dressing aprons
d. Metal instruments

79. The process of destroying all microbes including spores is called:
a. Disinfection
b. Antisepsis
c. Disinfestation
d. Sterilization

80. Out of the following the true statement regarding sterilization is:
a. Dry heat is the best method of sterilization of liquid paraffin
b. All glass syringes are best sterilized by boiling at 100°C
c. Bacterial vaccines are best sterilized by ethylene oxide
d. Pasteurization of milk by flash method is done by heating at 63°C for 30 minutes

81. Blood agar is an example of
a. Enriched media
b. Enrichment media
c. Nutrient media
d. Selective media

82. Conditions required for autoclave is
a. 121 °C temperature for 15 min
b. 121 °C temperature for 45 min
c. 100°C temperature for 60 min
d. 100°C temperature for 90 min

83. Sterilization of culture media containing serum is by:
a. Autoclaving
b. Micropore filter
c. Gamma radiation
d. Inspissation

84. Sterilization of fiberoptic bronchoscope is done by?
a. Glutaraldehyde
b. Chlorine
c. Autoclave
d. Phenol

85. Glassware is sterilized by?
a. Boiling
b. Hot air oven
c. Heating
d. None

86. The disposable plastic syringes are commonly sterilized by:
a. Formaldehyde
b. Ethylene oxide
c. Hexachloride
d. UV radiation

87. Which is enrichment media:
a. Selenite F broth
b. Chocolate media
c. Meat extract media
d. Egg media

88. In nutrient agar concentration of agar is:
a. 1%
b. 2%
c. 3%
d. 4%

89. Blood agar is an example of: (PGI)
a. Enrichment media
b. Indicator media
c. Enriched media
d. Selective media

90. Robert Koch's assistant advised him to use agar instead of gelatin as culture media for cultivation of bacteria as:
a. Agar has more nutrition
b. Gelatin melts at 27°C
c. Gelatin is not easily available
d. Agar is cheaper

91. Endoscope tube is sterilized by:
a. Glutaraldehyde
b. Formalin
c. Autoclaving
d. Boiling

76. a	77. c	78. a	79. d	80. a	81. a	82. a	83. d	84. a	85. b
86. b	87. a	88. b	89. b,c	90. b	91. a				

92. Browne's tube is used for:

a. Steam sterilization
b. Radiation
c. Chemical sterilization
d. Filtration

93. Prions are best killed by:

a. Autoclaving at 121°C
b. 5% formalin
c. Autoclave + Sodium hydroxide
d. Sodium hypochlorite

94. Virus mediated transfer of host DNA from one cell to another is known as:

a. Transduction b. Transformation
c. Transcription d. Integration

95. Bacteria may acquire characteristics by all of the following except:

a. Taking up soluble DNA fragments across their cell wall from other species
b. Incorporating part of host DNA
c. Through bacteriophages
d. Through conjugation

96. True about Lambda phage is:

a. Cause mad cow disease
b. Lytic and lysogenic interconversion can't occur
c. Lytic form incorporated within host DNA and multiply causing rupture of cell membrane
d. Lysogenic form incorporates with host DNA and remains dormant

97. Intraspecies competition is the competition among:

a. Species
b. Individuals of a population
c. Individuals of a community
d. Populations and their regulatory factors

98. The following phenomenon is responsible for antibiotic resistance in bacteria due to slime production:

a. Co-aggregation
b. Biofilm formation
c. Mutation evolving in altered target site for antibiotics
d. Mutation evolving a target bypass mechanism

99. Shine-Dalgarno sequence in bacterial mRNA is near:

a. AUG codon b. UAA codon
c. UAG codon d. UGA codon

100. Incorrect about plasmid is:

a. Involved in multidrug resistance transfer
b. Involved in Transformation
c. Imparts capsule formation
d. Imparts pili formation

101. True about bacteriophage is:

a. Can transmit toxin to bacteria
b. Bacteria which transmits DNA to another bacterium
c. Causes transformation of bacteria
d. Is a virus which invades bacteria

102. Which of the following contains both DNA and RNA?

a. Plasmids
b. Bacteria
c. Prions
d. Viroids

103. Horizontal transmission of 'R' factor is by:

a. Transduction
b. Transformation
c. Conjugation
d. Fusion

104. Polymerase chain reaction was discovered by

a. Saiki
b. Salk
c. Watson and Crick
d. Kary B Mullis

105. F plasmid of high frequency recombination is:

a. Extrachromosomal
b. Chromosomal
c. Mesosome
d. Ribosomes

92. a	93. c	94. a	95. b	96. d	97. b	98. b	99. a	100. b	101. d
102. b	103. c	104. d	105. a						

106. False regarding bacterial plasmids is?
a. Extrachromosomal
b. Eliminated by treating with radiation
c. Transmission of different characters
d. Can cause lysogenic conversion

107. Drug resistance transfer by bacteriophage involves:
a. Transduction
b. Conjugation
c. Transformation
d. Convocation

108. True about transferable resistance:
a. High degree of resistance
b. Involves resistance to multiple drugs
c. Plasmids play a role
d. All the above

109. Phage typing is useful as an epidemiological tool in all, except:
a. Salmonella
b. Staphylococcus aureus
c. V. cholerae
d. Shigella dysenteriae

110. Drug resistance is not transmitted by:
a. HFr b. Transposons
c. Plasmids d. Chromosomes

111. Following transmit drug resistance except:
a. RTF b. Plasmids
c. HFr d. Chromosome

112. All are true regarding Plasmid except :
a. Involved in multidrug resistance transfer
b. Involved in Transformation
c. Imparts capsule formation
d. Imparts pili formation

113. Conjugation does not involve:
a. Bacteriophages
b. HFr
c. Fr
d. Plasmids

114. Jumping gene is:
a. Transposon b. Episome
c. Cosmid d. Plasmid

115. Microbial killing below MIC is known as:
a. Adverse effect
b. Post antibiotic effect
c. Both
d. None

116. Mechanism of direct transfer of free DNA:
a. Transformation
b. Conjugation
c. Transduction
d. None

117. Transfer of some Extra chromosomal material from one bacterium to other can occur via:
a. F factor b. R factor
c. C factor d. All of the above

118. Endotoxin from gram negative organism is:
a. Polysaccharide
b. Glycoprotein
c. Lipoprotein
d. Lipopolysaccharide

119. The term "viable not cultivable" (VNC) is used for: (PGI)
a. M. leprae
b. M. tuberculosis
c. Treponema pallidum
d. Salmonella
e. Staphylococcus

106. d	107. a	108. d	109. d	110. d	111. c	112. b	113. a	114. a	115. b
116. a	117. d	118. d	119. a,c						

1. A. Smallpox virus

- All others also belong to bioterrorism agents of different categories.
- Among the choices, potential weapon for biological terrorism is Smallpox virus.

2. D. Histoplasmosis

- Histoplasmosis spreads by inhalation of spores.
- Other choices are transmitted by blood transfusion.

3. D. Vaccines are sterilized by filtration

- Spores are best destroyed by autoclaving and Eto
- Linens, media, reagents are best sterilized by autoclaving

4. D. Are formed primarily by the organisms of genus Streptococcus.

- Only spore forming human pathogenic bacteria are Bacillus and Clostridia.
- Streptococcus is a non spore forming bacterium.
- All other choices are correct regarding bacterial endospores.

5. C. Both of the above

- Bacillus anthracis possesses polypeptide capsule.
- S. pneumoniae, H. influenzae, N. meningitides and Cryptococcus neoformans possess polysaccharide capsule.

6. B. Cationic

- Most important surface active agent is quaternary ammonium compound (QAC) – cationic agent.
- Anionic – soaps are not as effective as QAC.

7. D. add contrast in order to see them better

- Main purpose of staining is to add contrast in order to see them better.
- Fixation mainly kills and secures then to slides.

8. D. the culture medium must be selective

- The medium may be a selective medium for E. coli.
- So it inhibits Staphylococcus epidermidis

9. A. has a peptidoglycan cell wall

- If no nucleus, it may be a prokaryote (Bacteria)
- Bacterial cell wall is made up of Peptidoglycan.

Pseudopod – Protozoa

10. B. a specific microbe is the cause of a specific disease

- Koch postulates establishes the relationship between the microbe and the specific disease caused by that microbe.
- Germ cell theory establishes that life forms can only arise from preexisting life forms.

11. D. Are too small to be seen with the unaided eye

- The Definition of microorganism is too small organisms that we cannot seen with unaided / naked eye.
- They are visualized with the help of microscope.

12. B. Found only in Gram-negative bacteria

- Endotoxins are the outer part of the lipopolysaccharide.
- Lipopolysaccharide is present only in Gram negative bacterial cell wall.
- All other choices are the features of Exotoxins.

13. B. B

Some Exotoxins are having A and B subunits.

- B subunit for binding with cell surface and push the A in to the cell.
- A is having enzymatic action.

14. D. Outer membrane

- Outer membrane of gram negative bacteria has Lipopolysaccharide (LPS).
- LPS Contains Lipid A, Core polysaccharide, and O side chain or somatic antigen.

15. D. Remain viable for a long time

- Probiotics are live microorganisms intended to provide health benefits when consumed, generally by improving or restoring the gut flora.
- Probiotics are considered generally safe to consume, but may cause bacteria-host interactions and unwanted side effects in rare cases.

16. D. Timing of blood culture collection need not coincide with fever spikes

17. D. 1%

- Phenol (carbolic acid) is one amongst the oldest antibacterial agents. It acts by inhibiting biological process of bacteria at concentration of 1% and is fungicidal in action at concentrations of 1%–2%.

18. C. 2% w/v chlorhexidine

- As per CDC guidelines, the best disinfectant for preparation of skin prior to insertion of a central venous catheter is 2% Chlorhexidine

19. B. The performance of steam sterilizer

- Bowie Dick Test is a diagnostic visual test performed to ensure the dynamic-air-removal system (Vacuum system) of a steam sterilizer. It effective in removing any air that may be trapped or leaked into the sterilization chamber

20 A. Geobacillus stearothermophilus

- The biological indicator in autoclave is Geobacillus stearothermophilus.
- Bacillus pumilus for radiation
- Bacillus subtilis (currently B. atropheus) for Hot Air oven

21. B. Biofilm formation

- Mechanisms of antibiotic resistance exhibited by bacterial biofilms.
- Bacteria that attach to a surface and grow as a biofilm are protected from killing by antibiotics.

22. E. None of the above

- Initially the universal / standard work precautions were applicable for blood and body fluids.
- But currently sputum also included.

23. A. Wash with plenty of soap and running water

- Wash needlesticks and cuts with soap and water.
- Flush splashes to the nose, mouth, or skin with water.
- Irrigate eyes with clean water, saline, or sterile irrigants.
- Report the incident to your supervisor.
- Immediately seek medical treatment.
- Do not squeeze/ put affected area in mouth or apply irritants like hypochlorite.

24. A. Manual cleaning, disinfecting, rinsing

- Manual cleaning with 2% glutaraldehyde.
- Other choices are not suitable for endoscopes.

25. D. Practice proper hand washing

- The best method to prevent post operative wound infection due to cross infection in the same ward is implementation of proper hand hygiene.

26. A. Mycobacterium chelonae

- Many studies revealed that M. chelonae is the common agent involved in contamination of endoscopes which are rinsed in poor quality tap water.

27. D. Phase 4

- Peptidoglycan, also known as murein,

is a polymer consisting of sugars and amino acids that forms a mesh-like layer outside the plasma membrane of most bacteria, forming the cell wall.

- The sugar component consists of alternating residues of β-(1,4) linked N-acetylglucosamine (NAG) and N-acetylmuramic acid (NAM) .
- Attached to the N-acetylmuramic acid is a peptide chain of three to five amino acids.
- The peptide chain can be cross-linked to the peptide chain of another strand forming the 3D mesh-like layer. Peptidoglycan serves a structural role in the bacterial cell wall, giving structural strength, as well as counteracting the osmotic pressure of the cytoplasm.
- Peptidoglycan is also involved in binary fission during bacterial cell reproduction.

28. D. Outer membrane

- Outer membrane, LPS, Periplasmic space, Porins are exclusively present in Gram negative bacteria.

29. C. Highly antigenic

- Exotoxins are produced by both Gram positive and Gram Negative
- Highly antigenic
- Proteins
- Very specific
- Toxoidable
- Heat labile

30. D. Superoxide dismutase

- Superoxide dismutase, originally known as erythrocuprein, catalyzes the reaction of two molecules of superoxide (O2.-) to yield one molecule of hydrogen peroxide (H2O2) and one molecule of oxygen (O2).
- Diffusion of hydrogen peroxide, the product of SOD1, across the cytosol is limited.

31. D. They have enzymes only for the EMP pathway

- An important route of glucose conversion to pyruvate such as glycolysis is Embden-Myerhof pathway.
- Glycolysis is the most important type of mechanism by which organisms obtain energy from organic compounds in absence of molecular oxygen. As it occurs in the absence of oxygen, therefore, it is also called anaerobic fermentation.

32. D. Phenol usually requires organic matter to act

- Phenol acts in the presence of organic matter. It doesn't mean that organic matter is needed for the action of phenol.

33. A. Mycobacterium chelonae

- Refer Q. No : 26

34. D. Bacillus stearothermophilus

- Bacillus stearothermophilus > B. atropheus Sub spp niger
- B. pumilus - radition

35. B. Internal sterilizing agent such as uracil N-glycosyls (UNG)

- The most common strategy to prevent carry-over contamination is to partially or completely replace dTTP with dUTP during PCR amplification, thereby producing DNA containing uracil.
- Prior to initiating PCR, the PCR mixture is treated with Uracil-DNA Glycosylase (UNG).
- During the initial denaturation step temperature is elevated to 95°C, resulting in cleavage of apyrimidinic sites and fragmentation of carry-over DNA.
- As the template contains thymidine, it will not be affected by the UNG treatment. It is a prerequisite that all PCRs are carried out with dUTP substituting dTTP.

36. A. PFGE

PFGE is gold standard genotyping tool

Other genotypic typing methods are:

- Chromosomal DNA analysis.
- Plasmid profile analysis.
- RFLP (Restricted fragment length polymorphism).
- Ribotyping (RFLP analysis of ribosomal DNA).

37. A. Germ theory of disease

- The germ theory was proposed by Girolamo Fracastoro in 1546.

38 C. Theories on immunity.

- Prontosil – Domagk
- Jerne's theory of antibody production using the concept of clonal selection.

39. D. Phase 4

- Refer Q. No 27

40. A. 70S

- Bacterial ribosome -70S
- Made up of 30S + 50S sub units
- Target for many antibiotics acting on protein synthesis

41. C. Kills all living microorganisms including spores

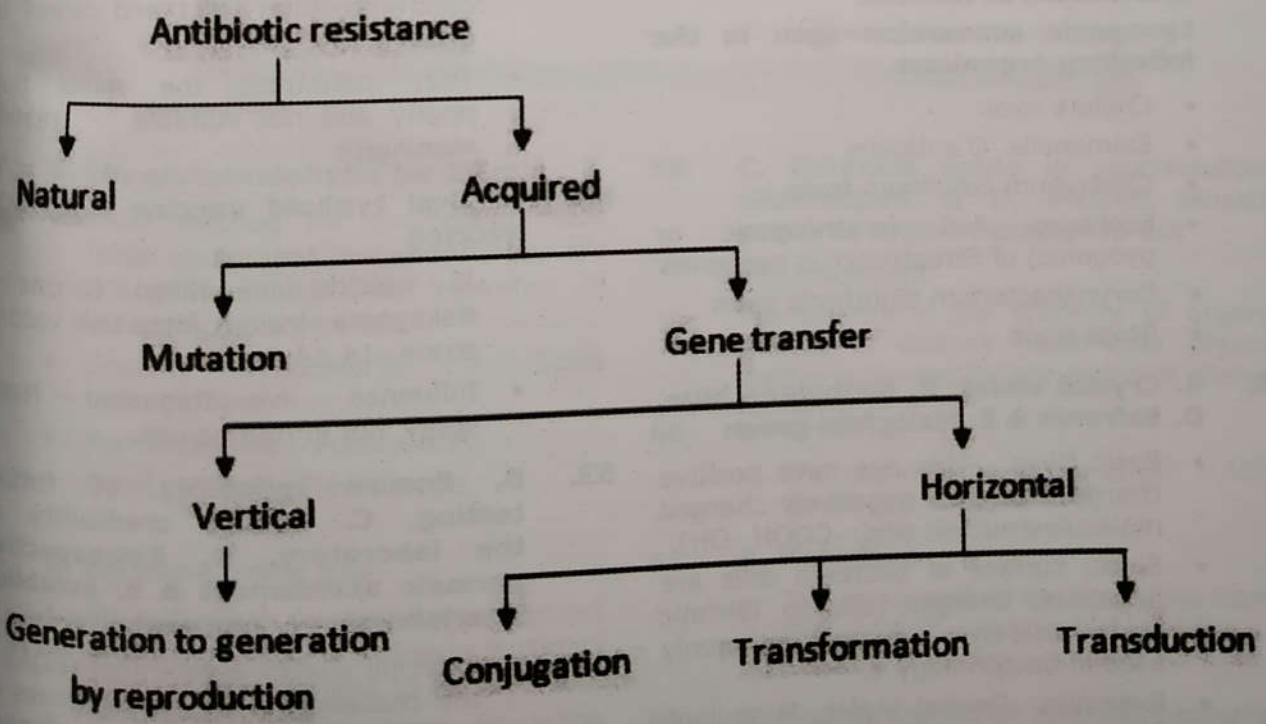
- Cidal – to kill
- Static agents – To prevent the growth
- Biocide – to kill all the microbes including spores
- Virucidal – to kill all the viruses.

42. D. Phenol

- Phenolic agents act by interrupting the cell membrane functions.
- Ideal concentration is 5%.
- Ethylene oxide and hydrogen peroxide acts by DNA damage.
- Aldehydes are strong alkylating agents.

43. B. If resistance is plasmid mediated, it is always transferred vertically.

- Plasmid mediated gene transfer – Conjugation
- Conjugation is horizontal gene transfer method.



44. C. Dideoxy ribonucleotides

The important things needed for PCR are

1. DNA template,
2. DNA polymerase enzyme,
3. Primers,
4. Nucleotides
5. Reaction buffer

45. A. Penicillium chrysogenum & B. Penicillium notatum

- Penicillium chrysogenum or P. notatum (formerly) is a species of fungus in the genus Penicillium.

Penicillium chrysogenum	Penicillin
Penicillium Griseofulvum	Griseofulvin
Acremonium spp	Cephalothin

46. A. It is made up of smaller units called flagellin, B. Bacteria with polar flagella move very fast & E. All flagella essentially have same chemical composition.

- Organ of locomotion.
- Antibodies to flagella are non productive
- Contains tail, hook and basal body

47. A. C. diphtheriae, B. Salmonella & E. Clostridium botulinum.

Lysogenic conversion seen in the following organisms

- Cholera toxin
- Salmonella O antigens
- Clostridium botulinum toxin
- Exotoxins A–C (erythrogenic or pyogenic) of Streptococcus pyogenes
- Corynebacterium diphtheria toxin
- Shiga toxin

48. A. Crystal violet, B. Methylene blue, D. Safranin & E. Malachite green

- Basic Dyes: This dye have positive charge & bind to negatively charged molecules(nucleic acid, -COOH -OH).
- Since, surface of bacterial cells are negatively charged (due to Teichoic acid), basic dyes are most commonly used in bacteriology.
- Examples: Crystal Violet, Methylene Blue, Safranin , basic fuschin

49. D. Microarray using gene CHIP

- A microarray is a laboratory tool used to detect the expression of thousands of genes at the same time. DNA microarrays are microscope slides that are printed with thousands of tiny spots in defined positions, with each spot containing a known DNA sequence or gene.

50. A. Uses Fluorescent probe for detection of amplified product & D. Risk of release of amplified product into environment less

- Real-time PCR (RT-PCR) is also called quantitative PCR or qPCR.
- The key feature in RT-PCR is that amplification of DNA is detected in real time as PCR is in progress by the use of fluorescent reporter.
- The fluorescent reporter signal strength is directly proportional to the number of amplified DNA molecules.

51. A. Bactericidal antimicrobial, B. Effective against Gram positive bacteria &

C. Effective against Gram negative bacteria

- They are poorly absorbed from the gastrointestinal tract and cannot be given orally.
- They penetrate the spinal fluid poorly and not suitable for treating meningitis

52. C. Oral typhoid vaccine & E. BCG vaccine

- JE vaccine - Killed vaccine - Nakayama strain & Atten Live vaccine strain -14-14-2
- Influenza – live attenuated – Nasal spray, not in routine use.

53. B. Ensure reliability of future testing, C. Ensure credibility of the laboratory, D. Retrospective periodic assessment & E. Establish interlaboratory comparability.

- External quality assessment (EQA) is the challenge of the effectiveness of a laboratories quality management system.

- EQA typically refers specifically to the challenge of quality systems in a medical laboratory.
- The term external refers to the fact that an organizer outside of the laboratories organisation provides a statement of quality to the laboratory.

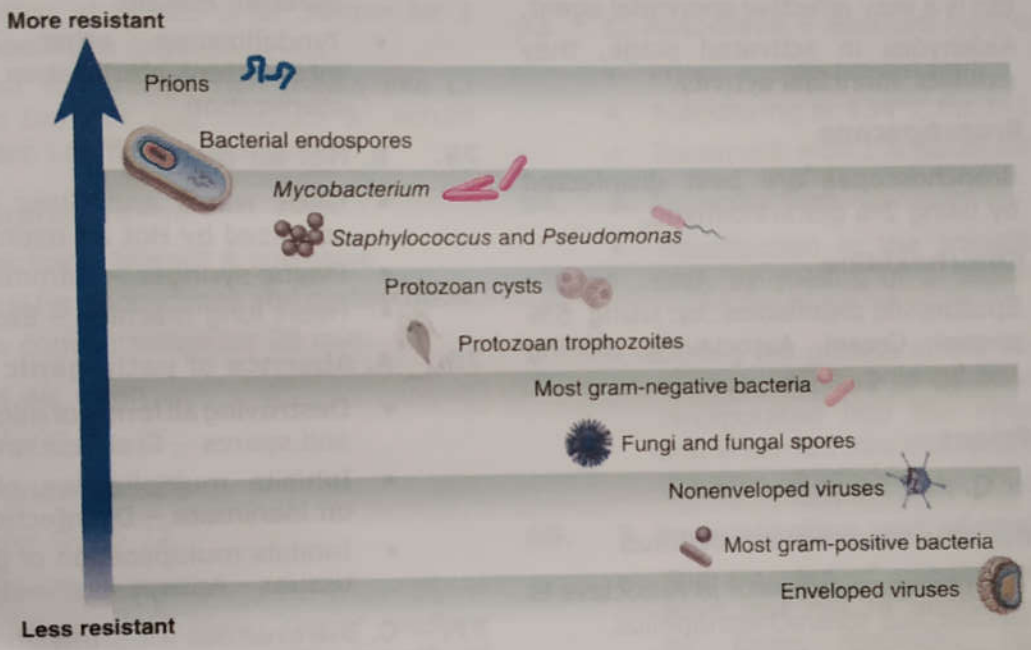
54. A. Nonirritant & C. Odourless

- OPA has the advantage that it a solid compared to liquid glutaraldehyde, though both are normally supplied in solution, and so a OPA has lower vapor pressure and much less smell than the pungent glutaraldehyde.
- In addition, OPA is more effective and so can be used at a lower concentration.

55. B. Nutrient broth is basal media

- Enrichment media are liquid media.
- Agar has no nutritive value.
- Chocolate agar is an enriched medium.

56. B. Prion



57. B. 2% glutaraldehyde for 20 min

- Ideal method for disinfecting heat labile equipment like endoscopes are 2% glutaraldehyde for minimum 20 minutes contact period.
- Sodium hypochlorite – Spills management.
- Formaldehyde – Fumigation.
- Ethyl alcohol – Stethoscope.

58. D. Ethylene oxide gas

- Eto is sterilant. Any surgical equipment contact with blood or tissue is comes under critical. It need to be sterilized.
- In case of heat labile items, Eto is the ideal method.

59. C. Ethylene oxide is intermediate disinfectant & D. Phenol usually requires organic matter to act

Eto is sterilant.

Phenol acts in the presence of organic matter. It doesn't mean that organic matter is needed for the action of phenol.

60. B. 49-63°C

- The warm cycle of Eto is 30° - 65°C for 8 – 12 hours

61. B. Radiation

- The ideal method for heat labile items like catgut, disposable plastics is ionizing radiation.

62. A. Prions, bacterial spores, bacteria

- Refer Q. no : 56

63. A. Dry heat & B. Ethylene oxide

- Autoclave, Eto, are the other examples of sterilization methods.

64. A. Chlorhexidine & B. Isopropyl alcohol

- These two agents are the reliable agents for hand washing.
- Anionic agents like detergents and soaps are also useful agents in hand washing

65. A. Glutaraldehyde, B. Ethylene oxide & C. Formaldehyde

- Eto is a very effective sporicidal agent.
- Aldehydes in activated stage, they exhibits sporicidal activity.

66. C. Bronchoscope

- Bronchoscopes are best disinfected by using 2% glutaraldehyde.

67. D. Chlorhexidine

- Sputum is disinfected by using 5% phenol, Cresol, Autoclaving, Boiling and burning.

68. C. Prions

Refer Q. no : 56

69. B. Bacillus stearothermophilus

- The biological indicator in Autoclave is Geobacillus stearothermophilus.
- Bacillus pumilus for radiation
- Bacillus subtilis (currently B. atropheus) for Hot Air oven

70. A. NaOH

- Sodium hydroxide is used as a digestive as well as decontaminating agent in sputum sample processing for smear preparation and culture. NALC -NaOH method is currently employed in many laboratories.

71. F. All of the above

- Hence surgical equipment is a broader term which includes scalpel blades, suture materials and many other items.
- All the choices are used for different type of surgical equipments

72. B. Ethylene oxide

- Disposable plastic syringes are best sterilized by ionizing radiation.
- Next ideal method is Eto

73. C. Steam at 121 °C for 15 minutes, 15 lb pressure

- Steam at 100°C for 30 minutes - Koch – Arnold steamer
- Dry Heat at 160°C for 120 minutes - Hot Air oven

74. A. Autoclaving

- Hot air oven – Oils, glasswares, liquid paraffin, metals
- Tyndallization other names are intermittent sterilization or fractional sterilization.

75. B. Hot air oven

- Glass wares and Glass syringes are sterilized by Hot air oven.
- Plastic syringes – Gamma radiation
- Heart lung machine – Eto

76. A. Absence of pathogenic microbes

- Destroying all forms of microorganisms and spores – Sterilization.
- Inhibits multiplication of pathogens on inanimate – Disinfection.
- Inhibits multiplication of pathogens in tissues - Antispesis.

77. C. Differential medium

- MacConkey agar differentiates Lactose fermenters from Non lactose fermenters
- It acts as selective medium, solid medium and Indicator medium

78. A. Plastic Syringes

- Cystoscopes - 2% cidex
- Dressing aprons – Autoclaving
- Metal instruments – Hot air oven / Autoclave

79. D. Sterilization

- Refer Q. no 76

80. A. Dry heat is the best method of sterilization of liquid paraffin

- Glass syringes – Hot air oven
- Bacterial vaccines – Seitz filter

- Pasteurization by flash method – 72°C – 15 -20 seconds followed by rapid cooling to 13°C

81. A. Enriched Media

- Enrichment media – Selenite F broth.
- Nutrient media – Nutrient agar.
- Selective media – TCBS agar, PLET medium etc.

82. A. 121 °C temperature for 15 min

- Refer Q. no 73

83. D. Inspissation

- Heating at 80–85°C for 30 min for 3 consecutive days.
- Used for protein rich media like LJ and Dorset's egg medium & serum based Loeffler's serum slope.

84. A. Glutaraldehyde

- Less toxic, irritant & corrosive.
- Ideal for endoscopes and cystoscopes: 2% concentration for 20 min.

85. B. Hot air oven

- Refer Q. no 75

86. B. Ethylene oxide

- Refer Q. no 72

87. A. Selenite F broth

- Enrichment Medium: Liquid medium (broth) that allows the growth of certain organisms and inhibits other organisms.
- Selenite F & Tetrathionate broth, Alkaline peptone water.

88. B. 2%

- In semisolid agar, the agar concentration is 0.5%
- In solid medium like nutrients agar, agar concentration is 1.5% to 2%

89. B. Indicator media & C. Enriched media

- Blood agar is an example for Enriched, Solid, Differential and Indicator medium

90. B. Gelatin melts at 27°C

- Agar is used as a solidifying agent in culture media.
- It has no nutritive value.
- The advantage over gelatine are, it is bacteriologically inert, and it melts at 98°C and usually solidifies at 42°C.

91. A. Glutaraldehyde

- Refer Q. no 57

92. A. Steam sterilization

- Brownie's tube used as a sterilization control for Hot air oven and autoclave.
- Radiation – Bacillus pumilus
- Filtration – Serratia marcescens

93. C. Autoclave + Sodium hydroxide

- Prions are destroyed by.
- Autoclaving at 134°C for 1–1.5 hour.
- Treatment with 1 N NaOH for 1 hour.

94. A. Transduction

- Transduction is the transfer of cell DNA by means of a bacterial virus (bacteriophage, phage).
- During the growth of the virus within the cell, a piece of bacterial DNA is incorporated into the virus particle and is carried into the recipient cell at the time of infection.

95. B. Incorporating part of host DNA

- The transfer of genetic information from one cell to another can occur by three methods: conjugation, transduction, and transformation.
- Not by integrating with host DNA.

96. D. Lysogenic form incorporates with host DNA and remains dormant

- During the temperate or lysogenic life cycle, the lambda phage DNA remains integrated with the bacterial chromosome as prophage.

97. B. Individuals of a population

- Intraspecific competition is an interaction in population ecology, whereby members of the same species compete for limited resources.
- This leads to a reduction in fitness for both individuals. By contrast, interspecific competition occurs

when members of different species compete for a shared resource.

98. B. Biofilm formation

- Refer Q. No 21

99. A. AUG codon

- The Shine-Dalgarno (SD) Sequence is a ribosomal binding site in bacterial and archaeal messenger RNA, generally located around 8 bases upstream of the start codon AUG.
- The RNA sequence helps recruit the ribosome to the messenger RNA (mRNA) to initiate protein synthesis by aligning the ribosome with the start codon.

100. B. Involved in Transformation

- Plasmid involved in conjugation.
- Responsible for multiple drug resistance, Capsule and pili formation.

101. D. Is a virus which invades bacteria

- It can transmit toxin gene not toxin.
- It is a virus.
- It involved in transformation.

102. B. Bacteria

- Bacteria possess both DNA and RNA.
- Virus possesses either DNA or RNA.
- Prions are devoid of nucleic acids.

103. C. Conjugation

- R plasmids are transferred by conjugation – a horizontal gene transfer method.

104. D. Kary B Mullis

- PCR discovered by Kary B Mullis.
- Waston and Crick – DNA double helix structure.
- Salk – IPV (Killed polio vaccine).

105. A. Extrachromosomal

- F plasmid is for fertility factor.
- It is an extrachromosomal element.
- Integration with bacterial DNA - Episome.

106. D. Can cause lysogenic conversion

- Lysogenic conversion caused by bacteriophage in the process of transduction.
- Plasmids can transmit multiple characters and responsible for toxin production, drug resistance and virulence.

107. A. Transduction

- Among the gene transfer processes, bacteriophage is involved only in transduction.

108. D. All the above

Other features are:

- No use of dose adjustment / combination.
- Horizontal transfer.
- No change in virulence.

109. D. Shigella dysenteriae

- Phage typing is an epidemiological tool for Salmonella, Vibrio and Staphylococcus.

110. D. Chromosomes

111. C. HFr

- All other choices can transmit drug resistance

112. B. Transformation

- Refer Q. no 100

113. A. Bacteriophages

- Conjugation involves pili and plasmid.
- Bacteriophages are involved in Transduction.

114. A. Transposon

- A transposable element or transposon is a DNA sequence that can change its position within a genome, sometimes creating or reversing mutations and altering the cell's genetic identity and genome size.

115. A. Post antibiotic effect

- The post antibiotic effect (PAE) is

defined as persistent suppression of bacterial growth after a brief exposure (1 or 2 hours) of bacteria to an antibiotic even in the absence of host defense mechanisms.

- Factors that affect the duration of the post antibiotic effect include duration of antibiotic exposure, bacterial species, culture medium and class of antibiotic.
- It has been suggested that an alteration of DNA function is possibly responsible for post antibiotic effect following the observation that most inhibitors of protein and nucleic acid synthesis (aminoglycosides, fluoroquinolones, tetracyclines, clindamycin, certain newer macrolides/ketolides, and rifampicin and rifabutin) induce long-term PAE against susceptible bacteria.

116. A. Transformation

- Transformation is the process by which a bacterial DNA molecule is taken up from the external environment and incorporated into the genome of the recipient bacteria.

117. D. All of the above

- F plasmid – Fertility factor.
- C plasmid – Colicin production.
- R Plasmid – Resistance factor.

118. D. Lipopolysaccharide

- Lipopolysaccharides (LPS), also known as lipoglycans and endotoxins, are large molecules consisting of a lipid and a polysaccharide composed of O-antigen, outer core and inner core joined by a covalent bond; they are found in the outer membrane of Gram-negative bacteria.

119. A. M. leprae & C. Treponema pallidum

- Other VNC are Chlamydia, Rickettsia & Virus.

Immunology — Questions

120. Antigen binding site in immunoglobulin is:

a. Variable region
b. Hypervariable region
c. Constant region
d. Idiotope

121. Most common infections after splenectomy are by

a. Capsulated bacteria
b. Uncapsulated bacteria
c. Gram positive sepsis
d. Gram negative bacteria

122. Antigen antibody precipitation is maximally seen in which of the following?

a. Excess of antibody
b. Excess of antigen
c. Equivalence of antibody and antigen
d. Antigen-hapten Interaction

123. Antibody that can cross placenta to protect foetus

a. IgA b. IgG
c. IgD d. IgM

124. Which of the following vaccines should not be given to an Immunodeficient person (PGI)

a. Killed Influenza vaccine
b. Rubella vaccine
c. Pneumococcal vaccine
d. Oral polio vaccine

125. Transplacental infections can occur with following (PGI)

a. N. gonorrhoeae
b. T. pallidum
c. T. gondii
d. P. aeruginosa

126. Which of the following complement components is a chemoattractant?

a. C3a b. C4a
c. C5a d. C3b

127. CRP is:

a. An antibody
b. Derived from pneumococcus
c. Decreased in pneumococcal infection
d. Detected by precipitation reaction with carbohydrate antigen

128. Differentiation between T cells & B cells is by all of the following except

a. T cells from Sheep-RBC rosette
b. B cells form EAC rossette
c. B cells have CD3 receptors
d. B cells have surface immunoglobulins

129. Major basic protein is formed by:

a. Lymphocyte b. Basophil
c. Neutrophil d. Eosinophil

130. Which one of the following does not contain C3b

a. Classical pathway C5 convertase
b. Alternate pathway C5 convertase
c. Classical pathway C3 convertase
d. Alternate pathway C3 convertase

131. In anaphylaxis

a. Antigen: cell bound; Antibody: free
b. Antigen: free; Antibody: cell bound
c. Antigen: cell bound; Antibody: cell bound
d. Antigen: free; Antibody: free

132. Which of the following is a neutralization test

a. Rose waaler
b. Paul Bunnell test
c. Widal test
d. Schick test

133. Hyperacute graft rejection is mediated by

a. Preformed antibodies
b. Lymphokines
c. In situ antibody formation
d. All of the above

120. b	121. a	122. c	123. b	124. b, d	125. b, c	126. c	127. d	128. c
129. d	130. c	131. b	132. d	133. a				

134. T cell multiplication is stimulated by

a. Bovine serum
b. Phytohaemagglutinin
c. Macrolin
d. Leukotrienes

135. The complement system aids the host defense by

a. Mediating inflammation
b. Attracting phagocytic cells
c. Activating phagocytic cells
d. All of the above
e. None of the above

136. Which of the following is a generic term for a protein or glycoprotein released by one cell population that acts as an intercellular mediator?

a. Cytokine
b. Monokine
c. Lymphokine
d. Interleukin

137. Which HLA type is closely linked with Rheumatoid arthritis?

a. HLA-A
b. HLA-B
c. HLA-DR
d. HLA-DP
e. HLA-DQ

138. Which of the following statements are true regarding immunodeficiency? (PGI)

a. Repeated microbial infection
b. Increased susceptibility to malignancy
c. Secondary immunodeficiencies are less common than primary
d. It involves CMI primarily
e. Decrease response to skin tests.

139. Which of the following mediators of hypersensitivity are formed de-novo after cell activation? (PGI)

a. Neutrophil chemotactic factor
b. Prostaglandin D2
c. Platelet activating factor
d. Eosinophil chemotactic factor
e. Histamine

140. General properties of complement include: (PGI)

a. It is present in normal sera
b. Increases on immunization
c. Gets activated by antigen-antibody complex
d. Destroyed at 56°C for 60 minutes.
e. Classical pathway complex is made up of 3 proteins.

141. Important properties of antigen-antibody complex include: (PGI)

a. Antigen-antibody reaction is firm
b. Binding takes place at surface
c. Only one part and not the whole molecule reacts.
d. No denaturation of antigen or antibody occurs during reaction.
e. Antigen-antibody reaction is not reversible.

142. Factors that influence the immune complex mediated damage in type III hypersensitivity include: (PGI)

a. Shape of immune complex
b. Size of the complex formed.
c. Local vascular permeability.
d. Rapidity with which these complexes are formed
e. Deposition of complexes in the body.

143. Adenosine deaminase deficiency is seen in the following:

a. Common variable immunodeficiency
b. Severe combined immunodeficiency
c. Chronic granulomatous disease
d. Nezelof syndrome

144. IL-1 produces:

a. T-lymphocyte activation
b. Delayed wound healing
c. Increased pain perception
d. Decreased PMN release from bone marrow

145. Which of the following best denotes classical complement pathway activation in immuno- inflammatory condition?

a. C2, C4 and C3 decreased
b. C2 and C4 normal, C3 is decreased
c. C3 normal and C2 C4 decreased
d. C2, C4, C3 all are elevated

146. Which is not a macrophage?

a. Monocyte
b. Microglia
c. Kupffer cells
d. Lymphocytes

134. b	135. d	136. a	137. c	138. a,b,e	139. b,c	140. a,c,d	141. a,b,c	142. b,c,e
143. b	144. a	145. a	146. d					

147. In Chediak higashi syndrome, defect is:

a. Fusion of lysosome
b. T-cells
c. B-cells
d. Complement

148. Hereditary angioneurotic edema is due to:

a. Deficiency of C1 esterase inhibitor
b. Deficiency of NADPH oxidase
c. Deficiency of MPO
d. Deficiency of properdin

149. The serum concentration of which of the following human IgG subclasses is maximum ?

a. IgG1 b. IgG2
c. IgG3 d. IgG4

150. All of the following forces are involved in antigen antibody reaction except:

a. Van der Waals forces
b. Electrostatic bond
c. Hydrogen bond
d. Covalent bond

151. Prozone phenomenon is due to:

a. Antigen excess
b. Antibody excess
c. False +ve reaction
d. False -ve reaction

152. The following methods of diagnosis utilize labeled antibodies except:

a. ELISA
b. Hemagglutination inhibition test
c. Radioimmunoassay
d. Immunofluorescence

153. C-reactive protein is:

a. An antibody as a result of pneumococcal infection
b. Derived from pneumococci
c. Detected by precipitation reaction
d. Increased in pneumococcal infection

154. Antibody diversity is due to: (PGI)

a. Gene rearrangement
b. Gene translocation
c. Antigenic variation
d. CD40 molecules
e. Mutation

155. The secretory component of IgA molecule is:

a. Formed by epithelial cell of lining mucosa
b. Formed by plasma cell
c. Formed by epithelial cell and plasma cell
d. Secreted by bone marrow

156. Which of the following immunoglobulins can cross placenta?

a. IgA b. IgM
c. IgG d. IgD

157. True about interferon is:

a. It is a synthetic antiviral agent
b. Inhibits viral replication in cells
c. Is specific for particular virus
d. None

158. True regarding clonal selection

a. Specific
b. Secondary response is rapid
c. Generation of diversity of antibody specificity
d. All

159. Antigen antibody precipitation is maximally seen in which of the following:

a. Excess of antibody
b. Excess of antigen
c. Equivalence of antibody and antigen
d. Antigen - Hapten interaction

160. Which portion of MHC 1 complex forms the component of antigen presenting part:

a. Between alpha-beta 2 microglobulin
b. Distal part of alpha chain
c. Proximal part of alpha chain
d. beta 2 microglobulin

161. Ova albumin antigen was injected into a rabbit. What antibody will it produce initially?

a. IgG b. IgM
c. IgE d. IgD

147. a	148. a	149. a	150. d	151. b	152. b	153. c	154. a,e	155. a	156. c
157. b	158. d	159. c	160. b	161. b					

162. Role of adjuvant in vaccine are all except:

a. Stimulation of Toll-like receptors
b. Activate B-lymphocyte only
c. Increase both adaptive and innate immune response
d. Activate both B and T lymphocyte
e. Ensure prolonged delivery of antigen

163. Examples of type I hypersensitivity is:

a. Lepromin test
b. Tuberculin
c. Casoni's test
d. Arthus reaction

164. Which of the following is an example of type IV hypersensitivity?

a. Granulomatous reaction
b. Schwartzman reaction
c. Arthus reaction
d. Serum sickness

165. Skin test based on neutralization reaction is/are:

a. Casoni test
b. Lepromin test
c. Tuberculin test
d. Schick test

166. Disorders of phagocytosis are all, except:

a. Job's syndrome
b. Chediak-Higashi syndrome
c. Myeloperoxidase deficiency
d. Wiskott-Aldrich syndrome
e. Tuftsin deficiency

167. Type IV hypersensitivity includes all, except:

a. Paul Bunnell test
b. Lepromin test
c. Tuberculin test
d. Granulomatous reactions

162. b	163. c	164. a	165. d	166. d	167. a

120. B. Hypervariable region

- The variable regions of both L and H chains have three extremely variable (hypervariable) amino acid sequences at the amino-terminal end that form the antigen-binding site.
- Only 5 to 10 amino acids in each hypervariable region form the antigen-binding site.
- Antigen–antibody binding involves electrostatic and van der Waals' forces and hydrogen and hydrophobic bonds rather than covalent bonds.
- The remarkable specificity of antibodies is due to these hypervariable regions.

121. A. Capsulated bacteria

B cells producing anticapsular antibodies are primarily found in the spleen.

122. C. Equivalence of antibody and antigen

- In precipitation test, the antigen is **in solution**.
- The antibody cross-links antigen molecules in variable proportions, and aggregates (precipitates) form.
- In the **zone of equivalence,** optimal proportions of antigen and antibody combine; the maximal amount of precipitates forms, and the supernatant contains neither an excess of antibody nor an excess of antigen .
- In the **zone of antibody excess,** there is too much antibody for efficient lattice formation, and precipitation is less than maximal.
- In the **zone of antigen excess,** all antibody has combined, but precipitation is reduced because many antigen–antibody complexes are too small to precipitate (i.e., they are "soluble").

123. B. IgG

IgG is the only antibody to cross the placenta; only its Fc portion binds to receptors on the surface of placental cells. It is therefore the most abundant immunoglobulin in newborns.

124. B. Rubella vaccine.
D. Oral polio vaccine.

Live vaccines are contraindicated in immunodeficient people and pregnant women.

125. B. T. pallidum
C T. gondii

Vertical Transmission of Some Important Pathogens

Mode of Transmission	Pathogen	Type of Organism[1]	Disease in Fetus or Neonate
Transplacental	Treponema pallidum	B	Congenital syphilis
	Listeria monocytogenes	B	Neonatal sepsis and meningitis
	Cytomegalovirus	V	Congenital abnormalities
	Parvovirus B19	V	Hydrops fetalis
	Toxoplasma gondii	P	Toxoplasmosis
Within birth canal/at the time of birth	Streptococcus agalactiae (group B streptococcus)	B	Neonatal sepsis and meningitis
			Neonatal sepsis and meningitis
	Escherichia coli	B	Conjunctivitis or pneumonia
	Chlamydia trachomatis	B	Conjunctivitis

	Neisseria gonorrhoeae	B	Skin, CNS, or disseminated infection (sepsis)
	Herpes simplex type-2	V	Hepatitis B
	Hepatitis B virus	V	Asymptomatic infection
	Human immunodeficiency virus3	V	Thrush
	Candida albicans	F	
Breast milk	Staphylococcus aureus	B	Oral or skin infections
	Cytomegalovirus	V	Asymptomatic infection
	Human T-cell leukemia virus	V	Asymptomatic infection

126. C. C5a

- C5a and the C5,6,7 complex attract neutrophils.
- They migrate especially well toward C5a.
- C5a also enhances the adhesiveness of neutrophils to the endothelium.

127. D. Detected by precipitation reaction with carbohydrate antigen

- CRP is an "acute-phase" protein that is elevated as much as 1000-fold in acute inflammation.
- CRP is not an antibody (which are γ-globulins) but rather a β-globulin. (Plasma contains α-, β-, and γ-globulins.)
- Note that CRP is a nonspecific indicator of inflammation and is elevated in response to the presence of many organisms, not just S. pneumoniae.
- Clinically, CRP in human serum is measured in the laboratory by its reaction(agglutination or precipitation) with the carbohydrate of S. pneumoniae. The medical importance of CRP is that an elevated CRP appears to be a better predictor of heart attack risk than an elevated cholesterol level.

128. C. B cells have CD3 receptors

CD3 is a pan T-cell marker.

129. D. Eosinophil

- Eosinophils are white blood cells with cytoplasmic granules that appear red when stained with Wright stain.
- The red color is caused by the negatively charged eosin dye binding to the positively charged major basic protein in the granules.

130. C. Classical pathway C3 convertase

Classical pathway C3 convertase is C14b2a.

131. B. Antigen: free; Antibody: cell bound

- An immediate hypersensitivity reaction occurs when an antigen (allergen) binds to IgE on the surface of mast cells with the consequent release of several mediators.
- The process begins when an antigen induces the formation of IgE antibody, which binds firmly by its Fc portion to receptors on the surface of basophils and mast cells.
- Reexposure to the same antigen results in cross-linking of the cell-bound IgE, degranulation, and release of pharmacologically active mediators within minutes (immediate phase).
- Cyclic nucleotides and calcium play essential roles in release of the mediators.
- Symptoms such as edema and erythema ("wheal and flare") and itching appear rapidly because these mediators (e.g., histamine) are preformed.

132. D. Schick test

Schick test is an in-vivo toxin neutralization test to assess susceptibility of a person to diphtheria.

133. A. Preformed antibodies

Hyperacute Rejection by Preexisting Antibodies:

- In rare instances, a transplant is rejected so quickly that the grafted tissue never becomes vascularized.
- These hyperacute reactions are caused by preexisting host serum antibodies specific for antigens of the graft and have the greatest impact in highly vascularized grafts (such as kidney and heart).
- Preexisting recipient antibodies bind to HLA antigens on the endothelial cells of the graft .
- These antigen-antibody complexes activate the complement system and result in an intense accumulation of neutrophils.
- The ensuing inflammatory reaction causes endothelial damage and obstructing blood clots within the capillaries, preventing vascularization of the graft .

134. B. Phytohaemagglutinin

T cell multiplication is stimulated by phytohaemagglutinin and concanavalin A.

135. D. All of the above

There are three main effects of complement:

(1) lysis of cells such as bacteria, allografts, and tumor cells;

(2) generation of mediators that participate in inflammation and attract neutrophils; and

(3) opsonization (i.e., enhancement of phagocytosis).

Complement proteins are synthesized mainly by the liver.

136. A. Cytokine

- Molecules that communicate among cells of the immune system are referred to as cytokines.
- In general, cytokines are soluble molecules, although some also exist in membrane-bound forms.
- The interaction of a cytokine with its receptor on a target cell can cause changes in the expression of adhesion molecules and chemokine receptors on the target membrane, thus allowing it to move from one location to another.
- Cytokines can also signal an immune cell to increase or decrease the activity of particular enzymes or to change its transcriptional program, thereby altering and enhancing its effector functions.
- Finally, they can instruct a cell when to survive and when to die.

137. C. HLA-DR

- Rheumatoid arthritis—In this disease, autoantibodies are formed against IgG.
- These autoantibodies are called rheumatoid factors and are of the IgM class.
- Rheumatoid arthritis affects primarily women between the ages of 30 and 50 years.
- People with HLA-DR4 genes are predisposed to rheumatoid arthritis.

138. A. Repeated microbial infection.
B. Increased susceptibility to malignancy.
E. Decreased response to skin tests.

139. B. Prostaglandin D2.
C. Platelet activating factor.

Principal mediators involved in type I hypersensitivity.

Mediator	Effects
Primary	
Histamine, heparin	Increased vascular permeability; smooth muscle contraction
Serotonin (rodents)	Increased vascular permeability; smooth muscle contraction
Eosinophil chemotactic factor (ECF-A)	Eosinophil chemotaxis
Neutrophil chemotactic factor (NCF-A)	Neutrophil chemotaxis

Proteases (tryptase, chymase)	Bronchial mucus secretion; degradation of blood vessel basement membrane; generation of complement split products
Secondary	
Platelet-activating factor	Platelet aggregation and degranulation; contraction of pulmonary smooth muscles
Leukotrienes (slow reactive substance of anaphylaxis, SRS-A)	Increased vascular permeability; contraction of pulmonary smooth muscles
Prostaglandins	Vasodilation; contraction of pulmonary smooth muscles; platelet aggregation
Bradykinin	Increased vascular permeability; smooth muscle contraction
Cytokines	
IL-1 andTNF-α	Systemic anaphylaxis; increased expression of adhesion molecules on venular endothelial cells
IL-4 and IL-13	Increased IgE production
IL-3, IL-5, IL-6, IL-10,TGF-β, and GM-CSF	Various effects (see text)

140. A. It is present in normal sera

C. Gets activated by antigen-antibody complex

D. Destroyed at 56°C for 60 minutes.

- The term 'complement' represents a group of proteins normally found in serum in inactive form, but when activated they augment the immune responses.
- They constitute about 5% of normal serum proteins and their level does not increase following either infection or vaccination.
- It gets denatured by hearing the serum at 56°C for 30 minutes. Such serum with lost complement activity is called inactivated serum.
- Classical pathway of complement is activated by antigen-antibody complex.

141. A. Antigen-antibody reaction is firm.

B. Binding takes place at surface.

C. Only one part and not the whole molecule reacts.

- Ag-Ab reaction involves specific interaction of epitope of an antigen with the corresponding paratope of its homologous antibody.
- It is a non-covalent interaction and hence reversible yet firm.

142. B. Size of the complex formed.

C. Local vascular permeability.

E. Deposition of complexes in the body.

- The reaction of antibody with antigen generates immune complexes.
- Generally, these complexes facilitate the clearance of antigen by phagocytic cells and red blood cells.
- In some cases, however, the presence of large numbers and networks of immune complexes can lead to tissue-damaging type III hypersensitivity reactions.
- The magnitude of the reaction depends on the number and size of immune complexes, their distribution within the body, and the ability of the phagocyte system to clear the complexes and thus minimize the tissue damage.
- The deposition of these complexes initiates a reaction that results in the recruitment of complement components and neutrophils to the site, with resultant tissue injury.
- Immune complexes bind to mast cells, neutrophils, and macrophages via Fc receptors, triggering the release of vasoactive mediators

and inflammatory cytokines, which interact with the capillary epithelium and increase the permeability of the blood vessel walls.

- Immune complexes then move through the capillary walls and into the tissues where they are deposited and set up a localized inflammatory response.

143. B. Severe combined immunodeficiency

- Patients with a hereditary absence of adenosine deaminase (ADA) and purine nucleoside phosphorylase (PNP) can have a severe deficiency of B cells and T cells, causing SCID, although some have only mild dysfunction.
- The absence of these enzymes results in an accumulation of deoxyadenosine triphosphate (dATP), an inhibitor of ribonucleotide reductase, and a consequent decrease in the deoxynucleoside triphosphate precursors of DNA.
- This reduces the formation of Bcell and T-cell precursors in the bone marrow.
- Bone marrow transplantation can be helpful.
- Injections of ADA conjugated to polyethylene glycol reduce the number and severity of infections.
- Several patients with ADA deficiency have benefited from gene therapy.
- A retroviral vector carrying a normal copy of the ADA gene was allowed to infect the patient's bone marrow cells.
- The ADA gene functioned within some of these cells, and the patient's immune status improved.

144. A. T-lymphocyte activation

- Cytokines of the interleukin 1 (IL-1) family are typically secreted very early in the immune response by dendritic cells and monocytes or macrophages.
- IL-1 secretion is stimulated by recognition of viral, parasitic, or bacterial antigens by innate immune receptors.
- IL-1 family members are generally proinflammatory, meaning that they induce an increase in the capillary permeability at the site of cytokine secretion, along with an amplification of the level of leukocyte migration into the infected tissues.
- In addition, IL-1 has systemic (whole body) effects and signals the liver to produce acute phase proteins such as the Type I interferons (IFNs α and β), IL-6, and the chemokine CXCL8.
- These proteins further induce multiple protective effects, including the destruction of viral RNA and the generation of a systemic fever response (which helps to eliminate many temperature-sensitive bacterial strains).
- IL-1 also activates both T and B cells at the induction of the adaptive immune response.

145. A. C2, C4 and C3 decreased

- In the classic pathway, antigen-antibody complexes activate C1 to form a protease, which cleaves C2 and C4 to form a C4b,2a complex.
- The latter is C3 convertase, which cleaves C3 molecules into two fragments, C3a and C3b.

146. D. Lymphocytes

- Monocytes that migrate into tissues in response to infection can differentiate into specific tissue macrophages.
- Like monocytes, macrophages can play several different roles.
- Some macrophages are long-term residents in tissues and play an important role in regulating their repair and regeneration.
- Other macrophages participate in the innate immune response and undergo a number of key changes when they are stimulated by encounters with pathogens or tissue damage.
- These are referred to as inflammatory macrophages and play a dual role in the immune system as effective phagocytes that can contribute to the clearance of pathogens from a tissue, as well as antigen-presenting cells that can activate T lymphocytes.

- Osteoclasts in the bone, microglial cells in the central nervous system, Kupffer cells in liver and alveolar macrophages in the lung are tissue-specifi c examples of macrophages with these properties.

147. A. Fusion of lysosome

Chédiak-Higashi Syndrome:

- In this autosomal recessive disease, recurrent pyogenic infections, caused primarily by Staphylococci and Streptococci, occur.
- This is due to the failure of the lysosomes of neutrophils to fuse with phagosomes.
- The degradative enzymes in the lysosomes are, therefore, not available to kill the ingested organisms.
- Large granular inclusions composed of abnormal lysosomes are seen.
- In addition, the neutrophils do not function correctly during chemotaxis as a result of faulty microtubules.
- The mutant gene in this disease encodes a cytoplasmic protein involved in protein transport.
- Peroxide and superoxide formation is normal, as are B-cell and T-cell functions.
- Treatment involves antimicrobial drugs.
- There is no useful therapy for the phagocyte defect.

148. A. Deficiency of C1 esterase inhibitor

- Inherited deficiency of C1 esterase inhibitor results in angioedema.
- When the amount of inhibitor is reduced, an overproduction of esterase occurs.
- This leads to an increase in anaphylatoxins, which cause capillary permeability and edema.

149. A. IgG1

Order of serum concentration of subtypes of IgG is: IgG1>IgG2>IgG3>IgG4.

150. D. Covalent bond

Bonds formed between antigen and antibody include hydrogen bonds,hydrophobic interactions, ionic bonds/electrostatic forces and vander waal forces. Covalent bond is not formed.

151. B. Antibody excess

Prozone is the zone of excess antibodies so the valency of all antibodies is not satisfied.

152. B. Hemagglutination inhibition test

- Many viruses clump red blood cells from one species or another (active hemagglutination).
- This can be inhibited by antibody specifically directed against the virus (hemagglutination inhibition) and can be used to measure the titer of such antibody.
- Red blood cells also can absorb many antigens and, when mixed with matching antibodies, will clump (this is known as passive hemagglutination, because the red cells are passive carriers of the antigen).

153. C. Detected by precipitation reaction

- CRP is an "acute-phase" protein that is elevated as much as 1000-fold in acute inflammation.
- CRP is not an antibody (which are γ-globulins) but rather a β-globulin. (Plasma contains α-, β-, and γ-globulins.)
- Note that CRP is a nonspecific indicator of inflammation and is elevated in response to the presence of many organisms, not just S. pneumoniae.
- Clinically, CRP in human serum is measured in the laboratory by its reaction(agglutination or precipitation) with the carbohydrate of S. pneumoniae. The medical importance of CRP is that an elevated CRP appears to be a better predictor of heart attack risk than an elevated cholesterol level.

154. A. Gene rearrangement.
E. Mutation.

Antibody diversity depends on

(1) multiple gene segments,

(2) their rearrangement into different sequences,

(3) the combining of different L and H chains in the assembly of immunoglobulin molecules, and

(4) mutations.

A fifth mechanism called junctional diversity applies primarily to the antibody heavy chain. Junctional diversity occurs by the addition of new nucleotides at the splice junctions between the V-D and D-J gene segments.

155. A. Formed by epithelial cell of lining mucosa

- The secretory component is a polypeptide synthesized by epithelial cells that provides for IgA passage to the mucosal surface.
- It also protects IgA from being degraded in the intestinal tract. In serum, some IgA exists as monomeric H2L2.

156. C IgG

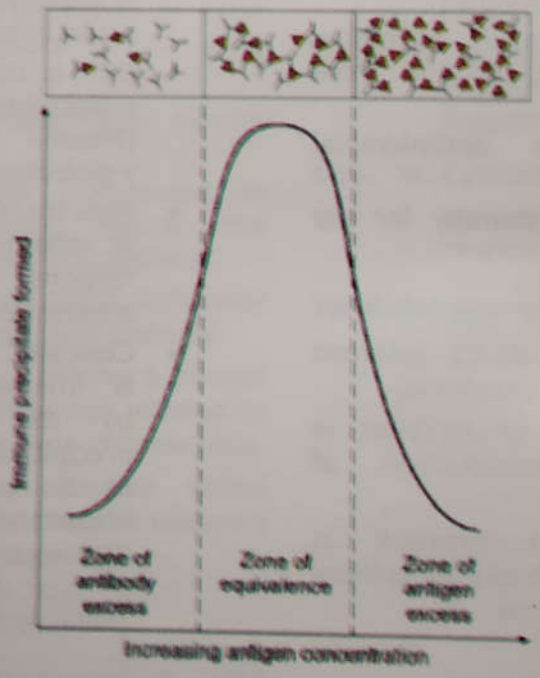
IgG is the only antibody to cross the placenta; only its Fc portion binds to receptors on the surface of placental cells. It is therefore the most abundant immunoglobulin in newborns.

157. B. Inhibits viral replication in cells

- Alpha and beta interferons are a group of proteins produced by human cells after viral infection (or after exposure to other inducers).
- They inhibit the growth of viruses by blocking the synthesis of viral proteins.
- They do so by two main mechanisms: One is a ribonuclease that degrades mRNA, and the other is a protein kinase that inhibits protein synthesis.
- Their inhibitory action is not specific for any particular virus.
- However, they are typically specific in regard to the host species in which they act (i.e., interferons produced by human cells are active in human cells but are much less effective in cells of other species).

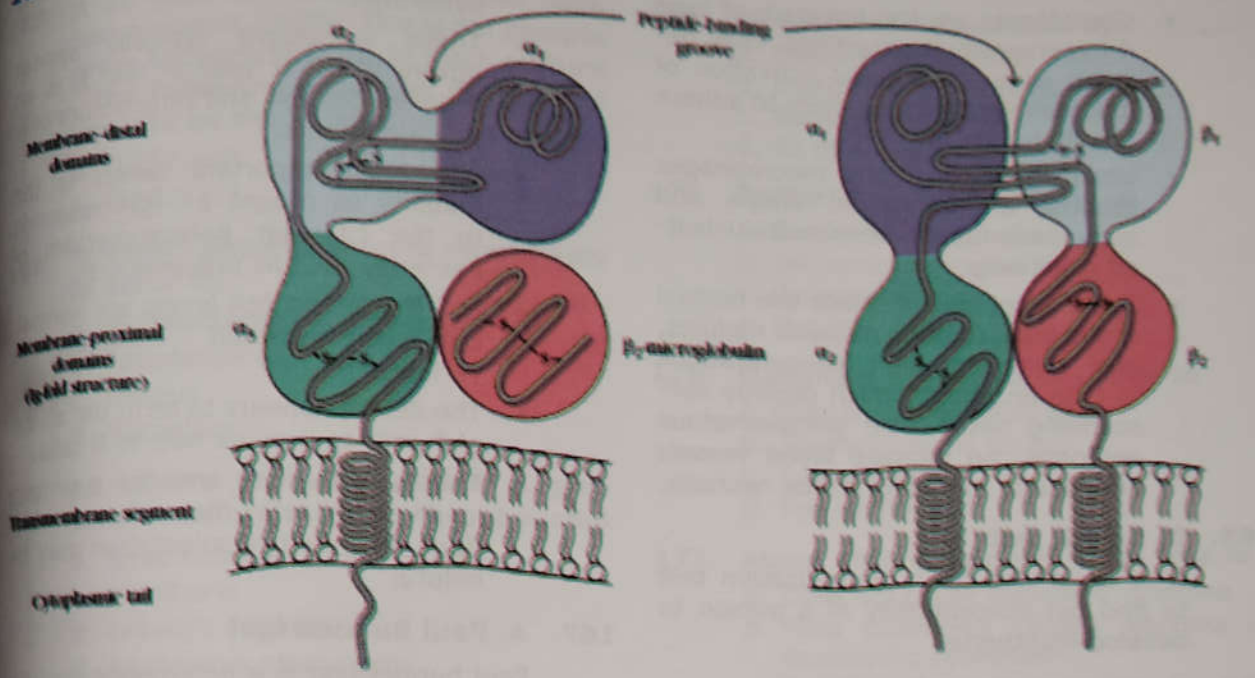
158. D. All

159. C. Equivalence of antibody and antigen



Precipitin curve. In the presence of a constant amount of antibody, the amount of immune precipitate formed is plotted as a function of increasing amounts of antigen. In the top part of the figure, the binding of antigen (▲) and antibody (Y) in the three zones is depicted. In the zones of antibody excess and antigen excess, a lattice is not formed and precipitation does not occur, whereas in the equivalence zone, a lattice forms and precipitation is maximal.

160. B. Distal part of alpha chain



Schematic diagrams of class I and class II MHC molecules showing the external domains, transmembrane segments, and cytoplasmic tails. The peptide-binding groove is formed by the membrane-distal domains in both class I and class II molecules (blue). The membrane-proximal domains (green and red) possess the basic immunoglobulin fold structure; thus, both class I and class II MHC molecules are classified as members of the immunoglobulin superfamily.

161. B. IgM

IgM is the antibody of primary immune response.

162. B. Activate B-lymphocyte only

- Adjuvants enhance the immune response to an immunogen.
- They are chemically unrelated to the immunogen and differ from a carrier protein because the adjuvant is not covalently bound to the immunogen, whereas the carrier protein is.
- Adjuvants can act in a variety of ways; they can cause slow release of immunogen, thereby prolonging the stimulus; enhance uptake of immunogen by antigen-presenting cells; and induce costimulatory molecules ("second signals").
- Another important mechanism of action of some adjuvants is to stimulate Toll-like receptors on the surface of macrophages, which results in cytokine production that enhances the response of T cells and B cells to the immunogen (antigen).
- Some human vaccines contain adjuvants such as aluminum hydroxide or lipids.

163. C. Casoni's test

- Casoni's Intradermal Test: It is an immediate hypersensitivity (Type 1) skin test introduced by Casoni in 1911, using fresh sterile hydatid fluid.
- The antigen in hydatid fluid is collected from animal or human cysts and is sterilized by Seitz or membrane filtration.
- The fluid is injected (0.2 mL) intradermally in one arm and an equal volume of saline as control is injected in the other arm.
- In a positive reaction, a large wheal of about 5 cm in diameter with multiple pseudopodia like projections appears within half an hour at the test side and fades in about an hour.
- A secondary reaction consisting of edema and induration appears after 8 hours. The test is almost abandoned now due to non specificity and has been supplemented by serological tests.

164. A. Granulomatous reaction

- Granulomas are the hallmark of type 4 hypersensitivity reactions, they develop when continuous activation of macrophages induces them to adhere closely to one another.
- Under these conditions, macrophages assume an epithelioid shape and sometimes fuse to form multinucleated giant cells .
- These giant cells displace the normal tissue cells, forming palpable nodules, and releasing high concentrations of lytic enzymes, which destroy surrounding tissue. The granulomatous response can damage blood vessels and lead to extensive tissue necrosis.

165. D. Schick test

It is an in-vivo toxin neutralization test to find out susceptibility of a person to develop diphtheria.

166. D. Wiskott-Aldrich syndrome

- Recurrent pyogenic infections, eczema, and bleeding caused by thrombocytopenia characterize this syndrome.
- These symptoms typically appear during the first year of life. It is an X-linked disease and thus occurs only in male infants.
- The most important defect is the inability to mount an IgM response to the capsular polysaccharides of bacteria, such as pneumococci.
- IgG levels and IgA levels are normal, but cell-mediated immunity is variable.
- The defect appears to be in the ability of T cells to provide help to B cells.
- The mutant gene encodes a protein involved in actin filament assembly. Bone marrow transplantation may be helpful.

167. A. Paul Bunnell test

Paul bunnel test is a heterophile agglutination test for presumptive diagnosis of infectious mononucleosis.

Bacteriology — Questions

168. A 20-year old man presented with hemorrhagic colitis. The stool sample grew Escherichia coli in pure culture . The following serotype of E.coli is likely to be the causative agent:

a. O 157: H7 b. O 159: H7
c. O 107: H7 d. O 55: H7

169. "L-form" phenomenon is most likely to occur in:

a. Mycobacterium tuberculosis
b. Pseudomonas
c. Proteus
d. Mycoplasma

170. All of the following cause a grey white membrane in the throat except

a. Streptococcal tonsillitis
b. Diphtheria
c. Ludwig's angina
d. Adenovirus pharyngitis

171. A male patient presented with granulomatous penile ulcer. On Wright-giemsa stain tiny organisms of 2 microns within macrophages seen. What is the causative organism?

a. LGV
b. Calymmatobacterium granulomatis
c. Neisseria
d. Staph aureus

172. Not used in leptospirosis

a. Microscopic agglutination test
b. Dark field illumination
c. Macroscopic agglutination test
d. Weil felix reaction

173. H.pylori infection is associated with development of

a. Gastrointestinal stromal tumor
b. Gastric (MALT) lymphoma
c. Gastric neuroendocrine tumor
d. Gastric polyp

174. Weil's disease is caused by

a. Trepenema pallidum
b. Leptospira interrogans
c. Borrelia burgdorferi
d. All of above

175. Bacterial vaginosis is due to

a. Gardnerella vaginalis
b. Trichomonas vaginalis
c. Candida albicans
d. E.coli

176. Malignant otitis extena is due to

a. Human papilloma virus
b. Staphylococcus aureus
c. Radiotherapy
d. Pseudomonas

177. About enterotoxigenic E.coli true is

a. Does not cause travellers' diarrhea
b. Most commonly causes diarrhea in developing countries
c. Invasion of gut mucosa
d. Fomite borne

178. Which of the followings is false about C.perfringens?

a. Food poisoning strains produce heat resistant spores
b. Show positive naegler reaction
c. Most important toxin is hyaluronidase
d. M.C. cause of gas gangrene

179. Malignant pustule is caused by

a. Carbuncle
b. Ulcerating melanoma
c. Anthrax of skin
d. None

180. All are true about Haemophillus influenzae except

a. Requires factors X and V
b. Doesn't affect infants below 2 months of age
c. Capsular polypeptide protein is responsible for virulence
d. M.C. invasive disease of H. influenzae is meningitis

168. a	169. d	170. c	171. b	172. d	173. b	174. b	175. a	176. d	177. b
178. c	179. c	180. c						

181. All are true regarding tetanus except
a. Transmission through contaminated wounds and injuries
b. More common in winters and dry weather
c. Reservoir in soil and intestines of humans and animals
d. No herd immunity or lifelong immunity

182. A 35-year-old labourer 3 years back presented with single indurated penile ulcer not treated. Later he presented with skin rash with neurological symptoms for which he got treated.Test to moniter response to treatment is
a. TPI
b. VDRL
c. FTA-ABS
d. Dark field microscopy

183. Characteristic of Bacillus cereus food poisoning is
a. Presence of Fever
b. Presence of Pain abdomen
c. Absence of Vomiting
d. Absence of Diarrhoea

184. Most common cause of antibiotic induced colitis:
a. Escherichia coli
b. Clostridium difficile
c. Salmonella
d. Campylobacter jejuni

185. The most common cause of non-gonococcal urethritis is
a. Trichomonas b. Chlamydia
c. Ureaplasma d. Mycoplasma

186. Causative agent of granuloma inguinale is
a. Calymmatobacterium granulomatis
b. Chlamydia trachomatis
c. Haemophilus ducreyi
d. Treponema

187. Buruli ulcer is caused by
a. Brucella b. Streptococcus
c. Spirillum minus d. M. ulcerans

188. Painful genital ulcers occur in (PGI)
a. Primary syphilis
b. Herpes genitalis
c. Granuloma inguinale
d. Chancroid

189. Pneumonia can be caused by following organisms
a. Chlamydia psittaci
b. Trichuris trichiura
c. Toxoplasma gondii
d. Echinococcus granulosus

190. All are zoonotic diseases except
a. Brucellosis b. Leptospirosis
c. Anthrax d. Diphtheria

191. Lyme disease is caused by
a. Treponema macdadei
b. Borrelia burgdorferi
c. Leptospira cutaneum
d. Treponama dammini

192. Listeria monocytogenes may cause all except
a. Myocardial necrosis
b. Spontaneous abortion & still birth
c. Multiple organ abscess
d. Meningitis

193. A disease seen in sewer workers is
a. byssinosis b. anthrax
c. brucellosis d. leptospirosis

194. Man is the terminal end for
a. Gonococcus b. Treponema
c. Tetanus d. Ancylostomiasis

195. Bartholinitis is caused by
a. Trichomonas b. Candida
c. Staphylococcus d. Gonococcus

196. Frei's test is used to diagnose
a. Granuloma inguinale
b. LGV
c. Donovanosis
d. Infectious mononucleosis

197. A biological false positive reaction for syphilis is most likely to occur in (PGI)
a. Enteric fever
b. Malaria
c. Leishmaniasis
d. Tropical eosinophilia

181. b	182. b	183. b	184. b	185. b	186. a	187. d	188. b,d	189. a	190. d
191. b	192. a	193. d	194. c	195. d	196. b	197. b,c,d			

198. Disease which can be transmitted by milk
a. Q fever
b. Poliomyelitis
c. Whooping cough
d. Diphtheria

199. Bubo is seen in all except
a. LGV
b. Plague
c. Donovanosis
d. Filariasis

200. Scalded skin syndrome is caused by
a. Staphylococcus
b. Klebsiella
c. Tinea
d. Candida

201. Granulomatosis infantiseptica is caused by
a. Measles virus
b. Streptococcus
c. Gonococcus
d. Listeria

202. All of the following can give membrane in the pharynx except
a. Staphylococcus aureus
b. Corynebacterium
c. Candida
d. Vincent's angina

203. Malignant pustule is associated with
a. Corynebacterium diphtheriae
b. Clostridium tetani
c. Bacillus anthracis
d. Streptococcus pyogenes

204. Eaton agent is
a. Corynebacterium
b. Pseudomonas
c. Mycoplasma
d. Gonococcus

205. Acute osteomyelitis in children is most often caused by
a. Staphylococcus aureus
b. Streptococcus pyogenes
c. Escherichia coli
d. Pseudomonas

206. The organism most commonly implicated in sub acute bacterial endocerditis
a. Staphylococcus albus
b. Staphylococcus aureus
c. Streptococcus faecalis
d. Viridans streptococci

207. Indicators of water pollution are all except
a. Escherichia coli
b. Clostridium perfringens
c. Streptococcus faecalis
d. Salmonella typhimurium

208. Following diseases are spread by mite
a. Trench fever
b. Endemic typhus
c. Scrub typhus
d. Q fever

209. Fatal septicemia is caused by
a. Streptococcus pyogenes
b. Group B streptococcus
c. Viridans streptococci
d. Staphylococcus albus

210. Erythrasma is caused by
a. Staphylococcus aureus
b. Streptococcus pyogenes
c. C. diphtheriae
d. C. minutissimum

211. Porter's disease is a synonym for
a. Relapsing fever
b. Weil's disease
c. Bubonic plague
d. Cutaneous anthrax

212. Helicobacter pylori is not associated with:
a. Gastrointestinal lymphoma
b. Gastric cancer
c. Gastric leiomyoma
d. Peptic ulcer

213. A child with pyoderma becomes toxic and presents with respiratory distress. His chest radiograph shows patchy areas of consolidation and multiple bilateral thin walled air containing cysts. The most likely etiological agent in this case is:
a. Mycobacterium tuberculosis
b. Staphylococcus aureus
c. Mycobacterium avium intracellulare
d. Pneumocystis carinii

198. a	199. c	200. a	201. d	202. a	203. c	204. c	205. a	206. d
207. d	208. c	209. b	210. d	211. d	212. c	213. b		

214. A 73-year-old woman with a history of diabetes presents with left ear pain and drainage of pus from the ear canal. She has swelling and tenderness over the left mastoid bone. Which of the following microorganisms is the most likely causative agent?

a. Hemophilus influenzae
b. Mucor spp.
c. Pseudomonas aeruginosa
d. Streptococcus pyogenes

215. Which of the following is not a horizontal gene transfer process?

a. Conjugation
b. Transduction
c. Transcription
d. Transformation

216. A patient with fever of 103 degrees F, bradycardia & leucopenia probably has

a. Influenza
b. Typhoid
c. Malaria
d. Meliodosis

217. The most probable organism causing food poisoning in a child who has eaten ice cream 16 - 18 hrs earlier is:

a. Salmonella typhimurium
b. C. botulinum
c. C. perfringens
d. Staphylococcus aureus

218. True about Mycobacterium tuberculosis is :

a. Strict aerobe
b. Gram –ve
c. Thin wall
d. Curved rod & cocci

219. All of the following method(s) can be used for monitoring efficacy of treatment in syphilis except:

a. FTA-Abs
b. RPR card test
c. Kahn Test
d. VDRL

220. Swarming growth is given by:

a. Clostridium tetani
b. Vibrio cholerae
c. Staphylococcus aureus
d. Bacillus anthracis

221. Treponemes can be visualized by all of the following except

a. Fluorescent microscopy
b. Gram stain
c. Silver stain
d. Dark-field microscopy

222. All of the following bacteria are halophilic except

a. V. parahaemolyticus
b. V. alginolyticus
c. V. vulnificus
d. V. cholerae

223. Tumbling motility is seen with

a. Proteus vulgaris
b. Vibrio cholerae
c. Listeria monocytogenes
d. Tatumella ptyseos

224. All of the following diseases are transmitted by louse except

a. Trench fever
b. Endemic relapsing fever
c. Epidemic relapsing fever
d. Epidemic typhus

225. Recrudescent infection is seen with

a. Plasmodium vivax
b. Chlamydia trachomatis
c. Rickettsia prowazekii
d. Mycoplasma pneumoniae

226. Acquisition of penicillin resistance in Staphylococcus due to

a. Mutation
b. Conjugation
c. Transduction
d. Transformation

227. Most common cause of UTI in pregnancy

a. Pseudomonas aeruginosa
b. Proteus mirabilis
c. Staphylococcus
d. Escherichia coli

214. c	215. c	216. b	217. a	218. a	219. a	220. a	221. b	222. d	223. c
224. b	225. c	226. c	227. d						

228. Each of the following statements concerning Clostridium perfringens is correct except

a. It causes gas gangrene
b. It causes food poisoning
c. It produces an exotoxin that degrades lecithin and causes necrosis and hemolysis
d. It is a gram-negative rod that does not ferment lactose

229. Each of the following statements concerning spirochetes is correct except

a. Species of Treponema are part of normal flora of mouth
b. Species of Borrelia cause a tick borne disease called relapsing fever
c. The species of Leptospira that cause leptospirosis grow primarily in humans and are usually transmitted by human to human contact
d. Species of Treponema cause syphilis and yaws

230. Ticks are vectors for transmission of each of the following diseases except

a. Rockey mountain spotted fever
b. Trench fever
c. Tularemia
d. Lyme disease

231. CAMP test is used for the identification of:

a. Group B streptococcus
b. Streptococcus pyogenes
c. Enterococcus faecalis
d. Viridans streptococci

232. A 30-year-old male patient has a large, spreading and exuberant ulcer with bright red granulation tissue over the glans penis. There was no lymphadenopathy. The most likely causative organism is:

a. Treponema pallidum
b. Herpes simplex virus type 1
d. Herpes simplex virus type 2
d. Calymmatobacterium granulomatis

233. All of the following are common causes of nosocomial infections, except:

a. Staphylococcus aureus
b. P. aeruginosa
c. Enterobacteriaceae
d. Mycobacterium

234. Mcfadyean reaction is seen in

a. Weil's disease b. Meningococcemia
c. Syphilis d. Malignant pustule

235. Panton valentine toxin is produced by

a. Staphylococcus b. Streptococcus
c. Gonococcus d. Pneumococcus

236. Anton's test is used for

a. Nocardia asteroides
b. L. monocytogenes
c. E. coli
d. K. pneumoniae

237. Oils & grease are sterilized by

a. hot air oven b. autoclaving
c. irradiation d. ethylene oxide

238. Which of the following organisms is the most common cause of septicemia in patients with sickle cell disease?

a. Salmonella enteritidis
b. Streptococcus pneumoniae
c. Streptococcus agalactiae
d. Shigella sonnei

239. A 42-year-old wig manufacturer who was involved in inspecting herds for raw material initially experienced only mild upper respiratory tract symptoms, but 2 days later was brought to the emergency room with fever, severe dyspnea, cyanosis, and tachycardia. Blood cultures were drawn and after 16 hours of incubation, the smears revealed large, gram-positive rods with subterminal spores. The organism was nonhemolytic on blood agar and nonmotile. What is the most probable identity of this organism?

a. Clostridium tertium
b. Bacillus anthracis
c. Clostridium perfringens
d. Bacillus subtilis

228. d	229. c	230. b	231. a	232. d	233. d	234. d	235. a	236. b
237. a	238. b	239. b						

240. A patient who recently returned from a camping trip is hospitalized with high fever and prostration that recurs every 5 to 7 days. Loosely coiled spiral-shaped organisms 10 to 20 microns in length are noted in a Wright-stained smear of the patient's blood. Which of the following is the most probably etiologic agent?

a. Leptospira interrogans
b. Spirillum minus
c. Borrelia hermsii
d. Treponema pallidum

241. A 16-year-old girl was admitted to a hospital because of hypotension, cyanosis, high fever (39. 9°C), and bilateral, non-fluctuant, inguinal, and axillary lymphadenopathy. The patient died the same day. Blood cultures obtained on admission were positive for bipolar-staining, short, gram-negative bacilli. What is the most probable etiologic agent?

a. Yersinia pestis
b. Brucella abortus
c. Klebsiella rhinoscleromatis
d. Francisella tularensis

242. Which of the following is the arthropod vector of Indian Tick Typhus?

a. Dermacentor species
b. Ornithodoros species
c. Culex species
d. Ixodes species

243. The antistreptolysin O titre is raised in infections caused by

a. Streptococcus sanguis
b. Streptococcus pneumoniae
c. Streptococcus pyogenes
d. Streptococcus bovis
e. Streptococcus mutans

244. Staphylococcal food poisoning is caused by:

a. Ingestion of preformed exotoxin
b. Colonization of a mucosal surface followed by the production of exotoxin
c. Colonization of a wound or abscess followed by local exotoxin production
d. All of the above
e. None of the above

245. The infectious stage of chlamydiae is called

a. Elementary Body
b. Reticulate Body
c. Contagious Body
d. Oogonial Body

246. The spirochetes include the causative agents for

a. Syphilis
b. Lyme disease
c. Both Syphilis and Lyme disease
d. Neither Syphilis and Lyme disease

247. Which genus of bacterium contributes to plaque, caries, gingivitis, and periodontal disease?

a. Streptococcus
b. Staphylococcus
c. Bacillus
d. Escherichia
e. Proteus

248. A bacterial culture with a starting density of 10^3 cells/ml is incubated in liquid nutrient broth. If the bacteria have both a lag time & generation time of 10 minutes, what will the cell density be at 30 minutes

a. 1.0×10^3
b. 2.0×10^3
c. 3.0×10^3
d. 4.0×10^3

249. In the management of leprosy, lepromin test is most useful for

a. Herd immunity
b. Prognosis
c. Treatment
d. Epidemiological investigations

250. A 60 year old man is diagnosed with carcinoma colon & is scheduled for surgery. He develops persistent low grade fever and constitutional symptoms. Physical examination is unremarkable other than a heart murmur not previously present. Outpatient blood cultures yield Gram positive, non-hemolytic cocci. The most likely cause for his clinical picture is

a. Spread of carcinoma
b. Anxiety with skin flora contamination of the blood cultures
c. Subacute endocarditis caused by Streptococcus bovis
d. Subacute endocarditis caused by group B streptococci

240. c	241. a	242. d	243. c	244. a	245. a	246. c	247. a
248. d	249. b	250. c					

251. A diagnosis of diphtheria is confirmed by

a. Typical microscopic appearance of the organism stained with methylene blue
b. Isolation of typical organisms from materials such as blood, showing invasiveness
c. Detection of beta phage plaques in cultures of suspicious isolates
d. Demonstration of toxin production by a suspicious isolate

252. A 20 years old male had pain in abdomen and mild fever followed by gastroenteritis. The stool examination showed presence of pus cells & RBC on microscopy. The etiological agent responsible is most likely

a. EIEC b. ETEC
c. EPEC d. EAEC

253. Anti tubercular drug susceptibility can be done by all of the following methods, except

a. Resistance ratio method
b. Disc diffusion method
c. Molecular method
d. Radiometric broth method

254. All are true about small colony variants (SCVs) of Staphylococcus aureus except

a. Grow as small, nonpigmented and non haemolytic colony on blood agar
b. Defective electron transport chain
c. Fail to express several putative virulence factors
d. Sensitive to gentamicin

255. Cefoxitin disk (30µg) diffusion is a better indicator of the presence of mecA mediated resistance than the oxacillin disk because

a. hyperproduction of beta-lactamases by borderline oxacillin-resistant strains of S. aureus
b. being an unstable compound, oxacillin is difficult to use in the laboratory
c. cefoxitin is a cheaper compound
d. MIC cannot be detected by oxacillin

256. A 10-year-old male child develops fever with signs of toxemia. BACTEC blood culture is negative at 48 hours. Throat examination revealed a white patch in the posterior pharyngeal wall. A Gram stained smear of the throat swab collected shows Gram positive rods. Optimum iron concentration of 0. 1 mg/L is essential for expression of its virulence factors. Which of the following macromolecules is important in iron metabolism?

a. Ferric oxide b. Lactoferrin
c. Siderophores d. Transferrin

257. A 45 year old female presented to OPD with carbuncle in the back of the neck. The pus culture showed CA-MRSA. Which is true

a. CA-MRSA is more virulent & less resistant
b. Scc I, II, III is related
c. Not associated with PVL
d. All are true

258. An outbreak of bacillary dysentery due to shigella species has occurred in the neonatal ICU. The epidemiologist has requested the Microbiologist to carry out typing of the organism to identify the source. Serotyping would be applicable in outbreaks due to all the species of Shigella except

a. S. dysenteriae b. S. flexneri
c. S. sonnei d. S. boydi

259. What typing method would be applicable for the above species

a. Phage typing b. Colicin typing
c. Biotyping d. Molecular typing

260. All are true except

a. Slide coagulase test detects coagulase enzyme
b. Slide coagulase test must be confirmed with tube coagulase test
c. Rabbit plasma with EDTA is the recommended media
d. S. intermedius & S. schleiferi may produce coagulase enzyme

251. d	252. a	253. b	254. d	255. a	256. c	257. a	258. c	259. b	260. a

261. Rapid test for detection of Methicillin resistance are all except

a. Cycling probe amplification
b. Fluorescence technique
c. Latex agglutination
d. Automated antimicrobial susceptibility test

262. Vancomycin intermediate S. aureus (VISA) is an emerging infection. The MIC of vancomycin for such strains as per CLSI guidelines is

a. <4 µg/ml b. 8-16 µg/ml
c. 16-32 µg/ml d. ≥ 32 µg/ml

263. Which of the following virulence factors in S. epidermidis is responsible for colonization and establishment of infection in the absence of foreign bodies such as catheter or stent?

a. Capsular polysaccharide Adhesin PS/A
b. Polysaccharide intercellular adhesin
c. Fibrinogen binding protein
d. Fatty acid modifying enzymes

264. Cell wall plays an important role in adherence. Central role in promoting initial adherence of group A β hemolytic Streptococci to pharyngeal epithelial cells

a. Lipoteichoic acid
b. M protein
c. Polysaccharide capsule
d. Hyaluronic acid

265. All are true for Streptococcus except

a. Streptodornase cleaves DNA
b. Streptolysin O is active in reduced state
c. Streptokinase is produced from serotype A, C, K
d. Pyrogenic toxin A is plasmid mediated

266. All are true regarding Pneumococci except

a. Strain isolated from conjunctiva are non-capsulated, rest are all having polysaccharide capsules
b. Empyema is the most common complication of Pneumococcal pneumonia
c. Austrian's syndrome is an occurrence in Pneumococcal pneumonia
d. 80% isolates are intermediate resistance to penicillin

267. A patient of RHD developed infective endocarditis after dental extraction. Most likely organism causing this

a. Viridans streptococci
b. Streptococcus pneumoniae
c. Streptococcus pyogenes
d. Staphylococcus aureus

268. HLAR strain is seen in

a. Staphylococci
b. Streptococci
c. Enterococci
d. Pneumococci

269. Expression of Van A gene in Enterococci leads to

a. Inducible high level resistance to Vancomycin & Teicoplanin
b. Inducible variable resistance to Vancomycin & Teicoplanin
c. Inducible low level resistance to Vancomycin & sensitive to Teicoplanin
d. Intrinsic low level resistance to Vancomycin & Teicoplanin

270. A 2 years old boy is hospitalized with Staphylococcus aureus pneumonia. He gives history of similar bouts of bacterial infections in the past. He had recovered uneventfully from measles 6 months ago. On examination, scant tonsillar tissue is noted with no lymphadenopathy. Immunoelectrophoresis reveals subnormal levels of gamma globulin. Nitroblue tetrazolium and chemiluminescence assays indicate phagocytic killing. The most likely disorder the child is suffering from is

a. Defect of the Btk gene
b. Defect of the SAP gene
c. Defect of the WAS gene
d. ICAM-1 deficiency

261. d	262. b	263. c	264. b	265. c	266. d	267. a	268. c	269. a	270. a

271. A 12-year-old boy develops glomerulonephritis a week after he was treated for a sore throat.The causative agent is identified by serotyping of the

a. Capsule
b. M proteins
c. Outer membrane proteins
d. Pili

272. Which of the following is incorrect about Mycobacterium tuberculosis?

a. Type specificity is due to protein Ag
b. Tuberculin from human, bovine and murine bacilli is indistinguishable
c. Ab is found to be useful for diagnosis
d. Ab are irrelevant in immunity

273. Which of the following is used for epidemiological typing of M. tuberculosis strain?

a. PCR based DNA amplification
b. Ligase chain reaction
c. TMA targeting rRNA
d. RFLP & IS fingerprinting

274. Which of the following tests is useful for diagnosing latent tuberculosis?

a. Mantoux test
b. PCR
c. IS 6110
d. γIFN release assay

275. Which of the following is not a characteristic feature of family Enterobacteriaceae?

a. Reduce nitrate to nitrite
b. Catalase +ve and Oxidase –ve
c. Motile only by peritrichous flagella or nonmotile, capsulated or non capsulated
d. Ferment lactose, produce acid and gas

276. All are true about brucella except

a. B. abortus is capnophilic
b. Transmitted by aerosol can occur occasionally
c. Paesturisation destroys it
d. 2 ME is used to detect IgA

277. Which of the following is incorrect about about UTI?

a. Commonly caused by E. coli serotypes found in faeces
b. Cystitis caused by mostly the strains which carry K Ag
c. Urine is a good medium for coliforms
d. S. aureus is significant even in low count

278. False about T. pallidum

a. T. phagedenis usually used in diagnosis of Syphilis
b. Transfusion syphilis can be prevented by storing the blood in refrigerator for 4 days
c. Polysaccharide Ag used in specific T. pallidum test
d. Serial passage in rabbit reduces the virulence of the spirochete to human being

279. Which of the following statements is false regarding relapsing fever?

a. Louse borne R. F. tends to occur as epidemic
b. Relapses are more frequent in tickborne R. F
c. Infection is transmitted by bite in both
d. More severe clinical picture in louse borne R. F

280. The alteration in serotype from S. anatum to S. Newington is due to

a. Mutation b. Transduction
c. Lysogeny d. Plasmid mediated

281. Regarding the antigenic variation of S. Typhi, which statement is incorrect?

a. Smooth to rough variation indicates loss of virulence
b. H-O variation is due to total loss of flagella
c. Flagellar phase 1 Ag is specific
d. V-W variation indicate agglutinable with O antisera

271. b	272. c	273. d	274. d	275. d	276. d	277. b	278. d	279. c
280. c	281. b							

282. A lac+, glucose fermenting, Gram negative rod isolated from a previously healthy child with bloody diarrhoea is most likely to be

a. Shigella sonnei
b. Pseudomonas aeruginosa
c. Escherichia coli
d. Salmonella enterica

283. Which of the following is false about H Ag?

a. Heat labile
b. Highly immunogenic
c. Form chalky granular clump in widal test
d. Increased titre seen in anamnestic reaction

284. All of the following Gram-negative bacteria are known to cause corneal ulcer EXCEPT:

a. Pseudomonas aeruginosa
b. Moraxella lacunata
c. Bacillus brevis
d. Klebsiella pneumonia

285. An elderly man presented with fever and cough. Sputum examination revealed gram negative organisms that were grown on Buffered charcoal yeast extract agar. The organism involved is?

a. H. influenzae
b. Legionella pneumophila
c. Burkholderia cepacia
d. Brucella

286. The bacteria producing pseudohaemoptysis is;

a. Erwinia herbicola
b. Mycobacterium tuberculosis
c. Serratia marcescens
d. Ehrlichia sennetsu
e. Legionella pneumophilla.

287. Diene's method is used for

a. Mycoplasma b. Plague
c. Chlamydia d. Diphtheria
e. Rickettsia

288. Which one of the following micro-organisms uses antigenic variation as a major means of evading host responses?

a. Streptococcus pneumoniae
b. Borrelia recurrentis
c. Mycobacterium tuberculosis
d. Listeria monocytogenes
e. Helicobacter pylori

289. Diazo reaction is useful for the diagnosis of

a. Typhoid fever between 5th to 14th days
b. Cholera
c. Typhoid fever in the 4th week
d. Meningococcal meningitis
e. Tuberculosis

290. Reverse CAMP test is positive for:

a. Clostridium tetani
b. Clostridium perfringens
c. Clostridium difficile
d. Clostridium novyi
e. Clostridium septicum

291. Most immunogenic in typhoid is:

a. O antigen b. Vi antigen
c. H antigen d. M antigen
e. Fimbrial antigen

292. PLET medium used for isolation of Bacillus anthracis consists of:

a. Polymyxin, lactose, EDTA and Thallous acetate.
b. Polymyxin, lysozyme, EDTA and Tetracycline.
c. Polymyxin, lactose, EDTA and Tetracycline.
d. Polymyxin, lysozyme, EDTA and Thallous acetate
e. Polymyxin, lactic acid, EDTA and Tetracycline

293. Panton-Valentine leucocidin is seen in infection with:

a. Streptococci
b. Staphylococcus
c. Gonococcus
d. Pneumococcus
e. Enterococcus

282. c	283. c	284. c	285. b	286. c	287. a	288. b	289. a	290. b	291. c
292. d	293. b								

294. Mucoid colonies are produced most often by Pneumococci type_____:

a. I
b. II
c. III
d. IV
e. V

295. A 73-year-old woman with a history of diabetes presents with left ear pain and drainage of pus from the ear canal. She has swelling and tenderness over the left mastoid bone. Which of the following microorganisms is the most likely causative agent?

a. Hemophilus influenzae
b. Klebsiella pneumoniae
c. Mucor spp.
d. Pseudomonas aeruginosa

296. The methods of isolation of Chlamydia are: (PGI)

a. Yolk sac inoculation
b. Cell culture using McCoy cell lines
c. Cell culture using HeLa cells
d. Cell culture using Vero cell lines
e. Preston medium

297. Regarding Helicobacter pylori infections following statements are true: (PGI)

a. More prevalent in developing countries.
b. Toxigenic strains can cause ulcers
c. All children in developing countries have immunity by 5 years of age.
d. About 50 % world's population is affected
e. Apart from humans the only other animal it infects is cat

298. A VDRL reactive mother has delivered recently. Which of the following tests can be used to determine the risk of transmission to newborn? (PGI)

a. TPHA on serum sample of mother
b. TPHA on serum sample of newborn
c. VDRL on the paired sample of the infant and mother
d. VDRL on serum sample of newborn.
e. RPR on serum sample of mother

299. Which of the following factors are true regarding XDR-TB? (PGI)

a. MDR-TB cannot get converted to XDR-TB
b. Diagnosis of XDR-TB is always laboratory based.
c. Symptoms of XDR-TB are same as drug susceptible tuberculosis.
d. XDR-TB strains are more common in HIV patients.
e. XDR-TB is Mycobacterium tuberculosis that is resistant to isoniazid, rifampicin, pyrazinamide any fluoroquinolone and streptomycin

300. Following statements are true regarding V cholerae O139 Bengal (PGI)

a. First discovered in Bengal.
b. Clinical manifestations are similar 01 EL Tor strains
c. Epidemiologically indistinguishable from 01 El Tor strain
d. Produces 01 lipopolysaccharide.
e. Preexisting immunity to V. cholerae offers protection against the V. cholerae O139 strain

301. Conjugate vaccines are available against: (PGI)

a. H. influenzae
b. Streptococcus pneumoniae
c. N. meningitides (group B)
d. N. meningitides (group C)
e. Listeria monocytogenes

302. Staining techniques used to stain Corynebacterium diphtheriae are (PGI)

a. Zeihl-Neelsen stain
b. Ponder's stain
c. Negative stain
d. Albert stain
e. Trichrome stain

294. c	295. d	296. a,b,c	297. a,b,d	298. b,c	299. b,c,d	300. b,c	301. a,b,d
302. b,d							

303. Following statements are true regarding botulism (PGI)

a. Infant botulism is caused by ingestion of preformed toxin
b. Clostridium botulinum A, B, E and F cause human disease.
c. The gene for botulinum toxin is coded by a bacteriophage.
d. Clostridium baratti may also cause botulinum.
e. The paralysis is of acute, spastic, ascending type

304. Weil Felix reaction is not useful in which of the following: (PGI)

a. Endemic typhus
b. Trench fever
c. Epidemic typhus
d. Q fever
e. Brill-Zinsser disease

305. Cat Scratch disease is associated with: (PGI)

a. Positive Frei test
b. Pathognomonic histological feature
c. Regional lymphadenopathy
d. Infection with Bartonella quintana infection
e. Oculoglandular syndrome of Parinaud commonly

306. XDR-TB is Mycobacterium tuberculosis that is resistant to:

a. Isoniazid and rifampicin
b. Isoniazid, rifampicin and pyrazinamide
c. Isoniazid, rifampicin, pyrazinamide any fluoroquinolone and streptomycin
d. Isoniazid, rifampicin and any fluoroquinolone
e. Isoniazid, rifampicin, any fluoroquinolone and kanamycin

307. DOTS strategy of WHO is an acronym, which stands for:

a. Directly observed treatment strategy
b. Directly observed therapy strategy
c. Directly observed therapy short course
d. Directly observed treatment short course
e. Directly observed tuberculosis strategy

308. 7 month-old infant presents with failure to thrive, progressive muscular weakness, and poor head control. On questioning, the mother states that she typically feeds the baby soy-based formula sweetened with honey. Which of the following organisms is most likely to be responsible for the child's presentation?

a. Clostridium botulinum
b. Clostridium difficile
c. Clostridium perfringens
d. Clostridium tetani

309. Gene in Vancomycin resistant enterococci shows following features: (PGI)

a. It imparts high-level resistance to vancomycin
b. It is not inducible
c. Resistance due to van A is not transferable.
d. It acts by synthesis of different peptidoglycan.
e. The isolates show low-level resistance to teicoplanin.

310. One of three blood culture bottles drawn from a patient with unexplained fevers reveals gram-positive cocci growing in clusters. Which of the following tests would be most useful in determining whether this organism is a part of the normal skin flora?

a. Bacitracin resistance
b. Catalase
c. Coagulase
d. Novobiocin resistance

311. Bacterial genome has been completely recognized for which one of the following agents:

a. H. pylori
b. Yersinia enterocolitis
c. Campylobacter jejuni
d. Streptococcus

303. b,c,d	304. b,d,e	305. b,c	306. e	307. d	308. a	309. a, d	310. c	311. a

312. A diabetic patient developed cellulitis due to S. aureus, which was found to be methicillin resistant on the antibiotic sensitivity testing. All the following antibiotics will be appropriate except:

a. Vancomycin b. Imipenem
c. Teicoplanin d. Linezolid

313. Staphylococcus aureus differs from staphylococcus epidermidis by:

a. Is coagulase positive
b. Forms white colonies
c. A common cause of UTI
d. Causes endocarditis of prosthetic valve

314. Which of the following statements is most correct regarding resistance to methicillin in MRSA:

a. Resistance is produced as a result of alteration in penicillin binding protein
b. Resistance is produced by production of β lactamase
c. Resistance is mediated by plasmids
d. Expression of resistance is enhanced by incubating at 38°C during susceptibility testing

315. All of the following statement are true about Staphylococci except:

a. A majority of infection caused by coagulase (-) ve Staph, are due to Staphylococcus epidermidis
b. β-Lactamase production is under plasmid control
c. Expression of methicillin resistance in Staphylococcus aureus increases when it is incubated at 37°C on blood agar
d. Methicillin resistance in Staph, aureus is independent of β-Lactamase production

316. Which one of the following Gram positive organisms is the most common cause of UTI among sexually active women:

a. Staphylococcus epidermidis
b. Staphylococcus aureus
c. Staphylococcus saprophyticus
d. Enterococcus

317. The following is a characteristic feature of Staphylococcal food poisoning except:

a. Optimum temperature for toxin production is 37°C
b. Intradietic toxin are responsible for intestinal symptoms
c. Toxin can be destroyed by boiling for 30 minutes
d. Incubation period is 1-6 hours

318. A patient in an ICCU is on CVP line. His blood culture shows growth of Gram-positive cocci which are catalase positive and coagulase negative. The most likely etiological agent is:

a. Staphylococcus aureus
b. Staphylococcus epidermidis
c. Streptococcus pyogenes
d. Enterococcus faecalis

319. Staphylococcus aureus causes vomiting in 6-8 hours. The mechanism of action is:

a. Stimulation of CAMP
b. Vagal stimulation
c. Stimulation of CGMP
d. Acts through ganglioside GM receptor

320. A cook prepares sandwiches for 10 people going for picnic. Eight out of them develop severe gastroenteritis within 4-6 hrs of consumption of the sandwiches. It is likely that on investigations the cook is found to be carrier of:

a. Salmonella typhi
b. Vibrio cholerae
c. Entamoeba histolytica
d. Staphylococcus aureus

321. A child after consuming food in a party complains of diarrhea within 1-5 hours. The diagnosis is:

a. S. aureus
b. Streptococcus
c. Clostridium perfringens
d. Clostridium botulinum

312. b	313. a	314. a	315. c	316. c	317. c	318. b	319. b
320. d	321. a						

322. Synergohymenotropic toxin of staphylococci consist of: (PGI)

a. α toxin
b. β toxin
c. γ toxin
d. δ toxin
e. Panton valentine toxin

323. Which of the following organisms is implicated in the causation of botryomycosis:

a. Staphylococcus aureus
b. Staphylococcus albus
c. Pseudomonas aeruginosa
d. Streptococcus pneumonia Streptococcus pyogenes

324. Staphylococcus in stool occurs in:

a. Staphylococcal food poisoning
b. Ischiorectal abscess
c. Toxic shock syndrome
d. May be a normal finding
e. Pseudomembranous colitis

325. Staphylococcus can cause: (PGI)

a. Ecthyma
b. Erythrasma
c. Furuncle
d. Impetigo contagiosa
e. Sycosis barbae

326. A 25-year-old IV drug abuser presents with fever for 3 weeks. ECHO shows tricuspid vegetation. The most likely organism associated with endocarditis in this case is:

a. Staphylococcus aureus
b. Candida albicans
c. Pseudomonas
d. Viridans streptococci

327. All of the following statements about Staphylococcus aureus are true except

a. Most common source of infection is cross infection from infected people
b. About 30% of general population is healthy nasal carriers
c. Epidermolysin and TSS toxin are super antigens
d. Methicillin Resistance is chromosomally mediated

328. Tropical pyomyositis is caused by

a. Streptococcus
b. Staphylococcus aureus
c. Pseudomonas
d. Pneumococcus

329. The antibody marker in serum for staphylococcal endocarditis is:

a. ASLO
b. Anti-teichoic acid
c. Anti-lipopolysaccharide
d. Anti-M-protein

330. Methicillin resistance in S. aureus is due to:

a. p-lactamase
b. mecA gene
c. AMPC gene
d. Porin develop

331. Cutaneous manifestation of Staphylococci are all except:

a. Furuncle
b. Follicular impetigo
c. TSS
d. TEN

332. Acute haematogenous osteomyelitis is commonly caused by:

a. S. aureus
b. Streptococcus pneumoniae
c. E. coli
d. Pneumococcus

333. Staphylococcal toxic syndrome is due to: (PGI)

a. Enterotoxin A
b. Enterotoxin B
c. Enterotoxin C
d. Enterotoxin D
e. Enterotoxin F

334. Staphylococcus aureus remains in the skin for longer period because of:

a. Catalase
b. Coagulase
c. Hyaluronidase
d. None

322. c,e	323. a	324. a	325. c,d,e	326. a	327. a	328. b	329. b	330. b	331. c
332. a	333. b,c,e	334. d							

335. Postoperative parotitis is caused by:

a. Staphylococcus aureus
b. Streptococcus
c. E. coli
d. Pneumococcus

336. Hot cold phenomenon is seen due to which toxin of staphylococci:

a. Alpha lysin b. Beta lysin
c. Gamma lysin d. Theta lysin

337. Staphylococcus differs from Streptococcus by:

a. Coagulase test
b. Catalase test
c. Phosphatase
d. Gram negative

338. A 30 years old female is on antibiotics with prolonged IV cannulation, has spike of fever, the likely cause is:

a. Pseudomonas aeruginosa
b. Coagulase negative staphylococcus
c. Streptococcus agalactiae
d. E. coli

339. Catalase positive coagulase negative gamma-haemolytic bacteria

a. Streptococcus pyrogens
b. Staphylococcus aureus
c. Coagulase negative staphylococcus
d. Enterococci

340. A cook is habitual of nose picking while cooking, his clients are at risk for food poisoning with

a. Clostridia difficile
b. Staphylococcus aureus
c. Vibrio cholerae
d. Bacillus cereus

341. All cause Fournier gangrene except:

a. Staphylococcus
b. Streptococcus
c. Clostridium
d. Bacteroides

342. Eight months after prosthetic valve replacement, most common organism causing infective endocarditis is:

a. Staphylococcus epidermidis
b. Viridans streptococci
c. Staphylococcus aureus
d. HACEK

343. A person from village is complaining of development of pustules. Extract from pus has shown gram positive cocci, showing hemolysis, catalase -ve, identified as a group of streptococci. Following test is used:

a. Bacitracin sensitivity
b. Novobiocin sensitivity
c. Optochin sensitivity
d. Hemolysis

344. True statement about antistreptolysin 'O' titre is:

a. In normal people the titre is <200
b. In acute glomerulonephritis, the titre is low
c. ASO titre >200 indicate rheumatic fever
d. Streptozyme test is an active hemagglutination test

345. The commonest organism causing cellulitis is:

a. Streptococcus pyogenes
b. Streptococcus faecalis
c. Viridans streptococci
d. Microaerophilic streptococci

346. 45 years old Ramlal has intra-abdominal sepsis. The causative organism was found to be vancomycin, gentamycin and ampicillin resistant. It grows well in presence of 6.5% NaCl and arginine. Bile esculin hydrolysis is positive. Which of the following is this organism?

a. Streptococcus agalactiae
b. Enterococcus fecalis
c. Streptococcus bovis
d. Streptococcus pneumoniae

335. a	336. b	337. b	338. b	339. c	340. b	341. c	342. a	343. a	344. b
345. a	346. b								

347. An infant had high grade fever and respiratory distress at the time of presentation to the emergency room. The sample collected for blood culture was subsequently positive showing growth of alpha-hemolytic colonies. On Gram staining these were gram-positive cocci. In the screening test for identification, the suspected pathogen is likely to be susceptible to the following agent:

a. Bacitracin b. Novobiocin
c. Optochin d. Oxacillin

348. Draughtsman colonies are seen in:

a. Staphylococcus
b. Salmonella
c. Pneumococcus
d. Corynebacterium

349. Which of the following causes dental carries?

a. Viridans streptococci
b. S. salivarius
c. S. mutans
d. S. agalactiae

350. Quellung reaction is due to

a. Capsular swelling
b. Mitochondrial swelling
c. RBC swelling
d. Ribosomal swelling

351. Most common cause of Post splenectomy infections:

a. Pneumococcus
b. Gonococcus
c. Staphylococcus
d. Corynebacterium

352. Differentiation of Neisseria gonorrhoeae and Neisseria meningitidis is by:

a. Glucose fermentation
b. Maltose fermentation
c. V. P. reaction
d. Indole test

353. Neisseria infections are associated with:

a. Deficiency of early complements
b. Deficiency of late complements
c. There is not such association
d. Any deficiency can be associated

354. Meningococci differ from gonococci in that they

a. Are intra-cellular
b. Possess a capsule
c. Cause fermentation of glucose
d. Are oxidase positive

355. Waterhouse-Friderichsen syndrome is seen in:

a. Pneumococcus
b. N. meningitidis
c. Pseudomonas
d. Yersinia

356. Gastrointestinal enteritis necroticans caused by:

a. C. difficile
b. C. perfringens
c. C. botulinum
d. C. jejuni
e. Pseudomonas

357. Which species of Clostridium does not cause gangrene?

a. C. perfringens
b. C. histolyticum
c. C. novyii
d. C. sporogenes

358. The most effective way of preventing tetanus is:

a. Surgical debridement and toilet
b. Hyperbaric oxygen
c. Antibiotics
d. Tetanus toxoid

359. A patient of acute lymphocytic leukemia with fever and neutropenia develops diarrhea after administration of amoxicillin therapy, which of the following organisms is most likely to be the causative agent?

a. Salmonella typhi
b. Clostridium difficile
c. Clostridium perfringens
d. Shigella flexneri

347. c	348. c	349. c	350. a	351. a	352. b	353. b	354. b	355. b	356. b
357. d	358. d	359. b							

360. Sub terminal spores are found in: (PGI)
a. Clostridium sordelli
b. Clostridium sporogenes
c. Clostridium difficile
d. Clostridium tertium
e. Clostridium botulinum

361. Clostridium group causes all except:
a. Acute oesophagitis
b. Diarrhea
c. Local necrosis
d. Antibiotic associated changes

362. Among the toxins produced by C. botulinum, the non- neurotoxic one is:
a. A b. B
c. C1 d. C2
e. D

363. Which type of Clostridium tetani has no flagella?
a. Type 1 b. Type 2
c. Type 4 d. Type 6

364. Oval bulging terminal spores seen in:
a. C. tertium
b. C. welchii
c. C. perfringens
d. C. histolyticum

365. Non-motile Clostridia is:
a. C. perfringens
b. C. novyi
c. C. botulism
d. CI. difficile

366. Most common organism responsible for gas gangrene is:
a. Clostridium perfringens
b. Clostridium difficile
c. Clostridium tetani
d. Clostridium botulinum

367. All occur in botulism except
a. Diplopia b. Diarrhoea
c. Dysphagia d. Dysarthria

368. Boxcar appearance is seen in:
a. Clostridium perfringens
b. Streptococci
c. Toxoplasma
d. Treponema pallidum

369. Tetanospasmin encoding genes are located on:
a. Chromosome
b. Plasmid
c. Both
d. Transposon

370. Nagler reaction is shown by:
a. C. Difficile b. C. perfringens
c. C. Tetani d. C. Butyricum

371. Mechanism of action of Tetanospasmin:
a. Inhibition of GABA release
b. Inhibition cAMP
c. Inactivation of ACh receptors
d. Inhibition of cGMP

372. Cause of Clostridium difficile associated diarrhea.
a. Trauma b. Dairy products
c. Fried rice d. Antibiotic use

373. Positive Schick's test indicates that person is:
a. Immune to diphtheria
b. Hypersensitive to diphtheria
c. Susceptible to diphtheria
d. Carrier of diphtheria

374. Ehrlich phenomenon is seen in:
a. Mycobacterium TB
b. Proteus
c. Staphylococcus
d. Corynebacterium
e. Mycoplasma

375. Literally leather term is used for:
a. Anthrax b. Proteus
c. Diphtheria d. Neisseria

376. True about diphtheria is:
a. Cause cranial nerve palsies in 2nd and 3rd week
b. Treatment with erythromycin
c. It is gram-negative organism
d. Passive immunization is harmful and should not be tried

360. a,b,e	361. a	362. d	363. d	364. a	365. a	366. a	367. b	368. a	369. b
370. b	371. a	372. d	373. c	374. d	375. c	376. a			

377. Metachromatic granules are stained by:

a. Ponder's stain
b. Negative stain
c. Gram's stain
d. Leishman's stain

378. Toxigenicity of C. diphtheria is determined by:

a. Elek's gel ppt test
b. Ascoli's reaction
c. Nagler's reaction
d. All

379. Investigation of choice of diphtheria carrier is:

a. Throat swab culture
b. Gram's stain
c. Albert's stain
d. Ziehl-Neelsen stain

380. Selective medium for Corynebacterium diptheriae is:

a. Loffler's serum
b. McConkey's medium
c. Cysteine-tellurite agar
d. LJ medium

381. C. diphtheriae is also called as:

a. Koch's bacillus
b. Roux bacillus
c. Klebs-Löffler bacillus
d. Yersin bacillus

382. Erythrasma is caused by:

a. Corynebacterium minutissimum
b. C. diphtheriae
c. C. ulcerens
d. C. vaginale

383. Schick test is for:

a. Susceptibility to diphtheria
b. Susceptibility to tetanus
c. Susceptibility to scarier fever
d. Susceptibility to RF

384. Characteristic of Bacillus cereus food poisoning is:

a. Presence of fever
b. Presence of abdominal pain
c. Presence of vomiting
d. Absence of diarrhoea

385. Noninvasive diarrhea can be caused by the following?

a. Shigella b. B. cereus
c. Salmonella d. Y. enterocolitica

386. Malignant pustule is caused by:

a. B. anthracis
b. Leishmania
c. Basal cell carcinoma
d. Pyoderma

387. An abattoir worker presented with a malignant pustule on his hand that progressed to form an ulcer. Smear was taken from the ulcer and sent to laboratory for investigation. The diagnosis is:

a. Cutaneous anthrax
b. Carbuncle
c. Ulcerating melanoma
d. Infected rodent ulcer

388. Characteristic infection of Nocardia asteroides is:

a. Diarrhea
b. Secondary
c. dissemination to liver
d. Brain abscess

389. A clinical specimen was obtained from the wound of a patient diagnosed as Nocardiosis. For the selective isolation of Nocardia sp. which one of the following would be the best method:

a. Paraffin bait technique
b. Castaneda's culture method
c. Craigie's culture method
d. Hair bait technique

390. True about Madura foot? (PGI)

a. Can erode bones
b. Spread to lymph nodes
c. Most commonly occur in hand
d. Slow growing
e. Antibiotic has no role

377. a	378. a	379. a	380. c	381. c	382. a	383. a	384. b	385. b	386. a
387. a	388. d	389. a	390. a,d						

391. A wool cutter is suffering from fever with a cervical lymph node enlargement for last 15 days, most likely he is suffering from:
a. Anthrax
b. Mycetoma
c. Sporotrichosis
d. Coccidiomycoses

392. Medusa head appearance:
a. Bacillus anthracis
b. Bacillus subtilis
c. Bacillus cereus
d. Bacillus licheniformis

393. A discharging sinuses seen in:
a.Sporotrichosis
b.Cryptococcosis
c.Histoplasmosis
d.Mycetoma

394. Most common cause of actinomycetoma in India:
a. Nocardia braziliensis
b. Actinomadura madure
c. Piedra
d. Tinea cruris

395. Actinomycosis most common site:
a. Cervicofacial b. Thorax
c. Abdomen d. Brain

396. A 28 years old lady presented with, headache, kernigs sign positive, culture showed gram positive bacilli, most probable organism is:
a. Listeria monocytogenes
b. H. influenzae
c. Meningococci
d. Streptococcus pneumoniae

397. Tumbling motility is shown as
a. Listeria monocytognes
b. Proteus Vulgaris
c. Borrelia
d. Clostridia

398. Basanti, 29 years aged female from Bihar presented with active TB. She delivers baby. All of the following are indicated except:
a. Administer INH to the baby
b. Withhold breastfeeding
c. Give ATT to mother for 2 years
d. Ask mother to ensure proper disposal of sputum

399. Selective media for TB bacilli is: (PGI)
a. NNN media b. Dorset media
c. LJ media d. Nutrient agar

400. Leprosy affects all the following except:
a. Uterus b. Ovaries
c. Eyes d. Nerves

401. The following drug is not used for the treatment of type II lepra reaction:
a. Chloroquine b. Thalidomide
c. Cyclosporine d. Corticosteroids

402. Tuberculin test is:
a. Anaphylaxis mediated
b. Cell mediated
c. Antibody mediated
d. Immune complex mediated

403. H_2SO_4 concentration to stain M. leprae is:
a. 1% b. 5%
c. 10% d. 20%

404. Typical mycobacterium is differentiated from atypical mycobacterium by:
a. Acid fast staining
b. Amidase test
c. Niacin test
d. Motility under microscope

405. BCG vaccine in HIV (+) newborn is:
a. Contraindicated
b. Double dilution
c. Half dilution
d. Dose double

406. Lepra bacilli are best cultivated in:
a. Guinea pig
b. Armadillos
c. Mouse foot pad
d. Nutrient agar

391. a	392. a	393. d	394. b	395. a	396. a	397. a	398. b	399. b,c	400. a
401. c	402. b	403. b	404. b	405. a	406. b				

407. The best diagnostic procedure of M. tuberculosis:
a. PCR
b. Auramine rhodamine stain
c. Sputum culture
d. Sputum examination

408. Drug resistance in tuberculosis is due to:
a. Transformation
b. Transduction
c. Conjugation
d. Mutation

409. For experimental work, Lepra bacilli are best cultured in:
a. Armadillos b. Mouse foot pad
c. Guinea pigs d. Rabbit testes

410. Which of the following is not a pathogenic Mycobacterium?
a. M. kansasii
b. M. scrofulaceum
c. M. chelonei
d. M. smegmatis

411. Buruli ulcer is caused by:
a. Streptococcus
b. Spirillum minus
c. M. ulcerens
d. Brucella

412. Reactive tubercular arthritis:
a. Spina ventusa
b. Pott's disease
c. Poncet's disease
d. None

413. ENL is seen in:
a. Lepromatous leprosy
b. Tuberculoid leprosy
c. Indeterminate leprosy
d. Pure neuritic leprosy

414. With reference to infection with Escherichia coli the following are true except:
a. Enteroaggregative E. coli is not associated with persistent diarrhea
b. Enterohemorrhagic E. coli cause hemolytic uremic syndrome
c. Entero-invasive E. coli produces a disease similar to salmonellosis
d. Entero toxigenic E. coli is a common cause of traveler's diarrhea

415. All are true about EHEC except:
a. Sereny test is positive
b. Does not ferment sorbitol
c. Causes HUS
d. Elaborates Shiga like exotoxin

416. E. coli attached to a surface with the help of:
a. Fucose
b. Concanavalin
c. Phytohemagglutinin
d. Lectin

417. A 24 years old cook in a hostel suffered from enteric fever 2 years back. The chronic carrier state in patient is diagnosed by:
a. VI agglutination test
b. Blood culture in brain heart infusion broth
c. Widal test
d. C. reactive protein

418. For typhoid endemic country like India, immunization of choice is:
a. TAB vaccine
b. Typhoral 21A oral vaccine
c. Monovalent vaccine
d. Any of these

419. True about salmonella gastroenteritis is/are: (PGI)
a. Mainly diagnosed by serological tests
b. Blood and mucous are present in stool
c. Caused by animal products
d. Symptoms appear between 4-48 hours
e. Features are mainly due to exotoxin

420. About Vi polysaccharide vaccine, true is:
a. Can be given in patients with yellow fever and hepatitis B
b. Has many contraindications
c. Has many serious systemic side effects
d. Has many serious local side effects

407. c	408. d	409. a	410. d	411. c	412. c	413. a	414. a	415. a	416. d
417. a	418. c	419. c,d	420. a						

421. Enterobacteriaceae includes all except: (PGI)
a. Pseudomonas
b. Klebsiella
c. V. cholerae
d. Proteus

422. Maximum urease is produced by:
a. H. pylori
b. P. mirabilis
c. K. rhinoscleromatis
d. Ureaplasma

423. DT 104 strain belongs to which of the following bacteria:
a. Salmonella gallinarum
b. Salmonella typhi
c. Salmonella enteritidis
d. Salmonella paratyphi A

424. Which is true of Enterobacteriacae?
a. All are oxidase negative
b. Nitrate reduction negative
c. Glucose not fermented by all
d. Motility by bipolar flagellum

425. "Pea-soup stool" is characteristically seen in:
a. Cholera
b. Typhoid
c. Botulism diarrhea
d. Traveller's diarrhea

426. Which subtype of E. Coli causes hemorrhagic colitis?
a. 0157:H7
b. 026:H1
c. Both of the above
d. None of the above

427. Incubation period of typhoid is:
a. 10-14 days b. 2-6 days
c. 18-72 hours d. 2-3 months

428. Microorganisms that enter freshly laid eggs are:
a. Salmonella b. Brucella
c. Shigella d. Vibrio cholerae

429. All of the following Salmonella are motile except:
a. S. typhi
b. S. enteritidis
c. S.gallinarum
d. S.chester

430. Non-lactose fermenter includes all the following except:
a. Shigella sonnei
b. Shigella dysenteriae
c. Shigella flexneri
d. Shigella boydii

431. Shigella are be divided into sub group on the basis of ability to ferment:
a. Lactose b. Maltose
c. Fructose d. Mannitol

432. A person returns to Delhi from Bangladesh after 2 days and has diarrhea. Stool examination shows RBCs in stool. The likely organism causing is:
a. Enteropathogenic E. coli
b. Enterotoxigenic E. coli
c. Salmonella typhi
d. Shigella dysenteriae

433. E coli labile toxin acts by:
a. Increasing cAMP
b. Decreasing cAMP
c. Decreasing protein synthesis
d. Decreasing cGMP

434. Which toxin is mediated by c-AMP except:
a. V. cholera 01
b. Heat stable E. coli toxin
c. Heat labile E. coli toxin
d. V. cholerae

435. E. coli gives pink color with:
a. Chocolate agar
b. L J medium
c. MacConkey's medium
d. Saline broth

436. Preformed toxin is important in food poisoning due to all except
a. S.aureus
b. Clostridium botulinum
c. ETEC
d. B. cereus

421. a,c	422. a	423. b	424. a	425. b	426. a	427. a	428. a	429. c	430. a
431. d	432. d	433. a	434. b	435. c	436. c				

437. In E. coli true is
a. ETEC is invasive
b. EPEC acts via cAMP
c. P- pili present in uropathogenic type
d. ETEC cause HUS

438. A child with fever with RBCs and pus in stool, causative organism is
a. ETEC b. EHEC
c. EPEC d. EAEC

439. In donovanosis:
a. Pseudo lymphadenopathy
b. Penicillin is used for treatment
c. Painful ulcer
d. Suppurative lymphadenopathy

440. Widal test is based on:
a. Complement fixation
b. Agglutination
c. Both
d. None

441. Recommended transport medium for stool specimen suspected to contain enteric pathogens is:
a. Amie's medium
b. Buffered glycerol saline medium
c. MacConkey medium
d. Blood agar

442. All of the following are true about V. cholerae 0139 except:
a. Clinical manifestations are similar to O1 Eltor
b. First discovered in Chennai
c. Produces 01 lipopolysaccharide
d. Epidemiologically indistinguishable from O1 Eltor

443. In the small intestine, cholera toxin acts by:
a. ADP ribosylation of G regulatory protein
b. Inhibition of adenyl cyclase
c. Activation of GTPase
d. Active absorption of NaCl

444. The effect of cholera toxin is mediated via the stimulation of following second messenger:
a. cAMP
b. GMP
c. Calcium-calmodulin
d. Acetylcholine

445. The best suited medium for Vibrio cholerae is:
a. Thayer martin
b. TCBS medium
c. Skirrow's medium
d. Loffler's medium

446. A 32 years old male, Kalu who recently visited a sea coast presented with ulcer over the left leg. The probable cause is:
a. Pasteurella multocida
b. Micrococcus halophillus
c. Vibrio vulnificus
d. Neisseria gonorrhea

447. Strain of V. cholerae in Bengal
a. 0:037 b. 0:139
c. 0:17 d. 0:40
e. 0:149

448. Which of the following has shortest incubation period?
a. Plague b. Cholera
c. Measles d. Typhoid

449. True about cholera vibrio is:
a. Can tolerate wide range of alkaline pH
b. Nonmotile bacilli
c. Cannot be grown in media
d. NaCl stimulates growth

450. Transport medium for cholera:
a. LJ medium
b. Cary Blair medium
c. MYPA medium
d. Stewart medium

451. True about cholera: (PGI)
a. Gram negative rod
b. Associated with fever
c. Causes painful watery diarrhea
d. It is an achlorhydria which renders an individual susceptible to disease.

437. c	438. b	439. a	440. b	441. b	442. c	443. a	444. a	445. b	446. c
447. b	448. b	449. a	450. b	451. a,d					

452. The following statements are true regarding Melioidosis except:

a. It is caused by Burkholderia mallei
b. The agent is a gram-negative aerobic bacteria
c. Bipolar staining of etiological agent is seen with methylene blue
d. The most common form of Meliodosis is pulmonary infection

453. A 50-year-old chronic alcoholic male agriculture worker presented with high grade fever of one week with spells of chills and rigor. Examination of the respiratory system reveals bilateral crepitation with scattered rhonchi. Multiple subcutaneous nodules were found on extensor surface of left forearm and left leg. Direct microscopy of the pus aspirate from the nodules reveals plenty of gram(-)ve bacilli with bipolar staining. Culture reveals distinct rough corrugated grey white colonies on blood agar. The organisms were motile and oxidase-positive. The most likely diagnosis is:

a. Plague
b. Melioidosis
c. Bartonellosis
d. Actinomycosis

454. True about Y. pestis: (PGI)

a. Gram +ve b. Gram -ve
c. Motile d. Non-motile
e. It is coccobacilli

455. A farmer presents to the emergency department with painful inguinal lymphadenopathy and history of fever and flu like symptoms. Clinical examination reveals on ulcer in the leg. Which of the following stain should be used to detect suspected bipolar stained organism.

a. Alberts stain
b. Ziehl Neelsen stain
c. Wayson's stain
d. McFadyen's stain

456. Blue pus found in infection:

a. Staph
b. Streptococcus
c. Pseudomonas
d. Mycoplasma

457. Glanders is caused by:

a. Protozoa b. Virus
c. Fungi d. Bacteria

458. Pyocyanin is formed by:

a. Yersinia
b. Pseudomonas
c. Burkholderia
d. Pasteurella

459. Pseudomonas toxin acts by:

a. increased cAMP
b. decreased cAMP
c. inhibition of Protein synthesis
d. increased cGMP

460. In India outbreak of plague occurred in all the following states except

a. Gujarat b. Maharashtra
c. Kerala d. MP

461. Ecthyma gangrenosum is caused by:

a. Pseudomonas
b. Streptococcus
c. Staphylococcus
d. H. influenza

462. False about H. influenzae:

a. It needs X and V factor for growth
b. Protein capsule plays an important role in pathogenicity
c. It is a rare cause of meningitis in the first 2 months of life.
d. Most common invasive manifestation is meningitis

463. The following are true for Bordetella pertussis except:

a. It is a strict human pathogen
b. It can be cultured from the patient during catarrhal stage
c. It leads to invasion of the respiratory mucosa
d. Infection can be prevented by a acellular vaccine

452. a	453. b	454. b,d,e	455. c	456. c	457. d	458. b	459. c	460. c	461. a
462. b	463. d								

464. The usual incubation period of pertussis is:

a. 7-14 days b. 3-5 days
c. 21-25 days d. Less than 3 days

465. True regarding pertussis vaccine is:

a. 95% of vaccinated are protected
b. Erythromycin should be given to contacts
c. Neuroparalytic complication is seen in 1 in 15000
d. Leukocytosis is diagnostic

466. In which of the following organism the capsule does not act as a virulence factor?

a. H. influenzae
b. Streptococcus pneumoniae
c. N. meningitidis
d. Bordetella pertussis

467. Acellular pertussis vaccine contains:

a. Pertactin, flagellar hemagglutinin, cytotoxin, endotoxin
b. Pertactin, flagellar hemagglutinin, fimbriae, endotoxin
c. Pertactin cytotoxin, fimbriae
d. Filamentous hemagglutinin, pertussis toxin

468. A veterinary doctor had pyrexia of unknown origin. His blood culture in special laboratory media was positive for gram-negative short bacilli which was oxidase positive. Which one of the following is the likely organism grown in culture?

a. Pasteurella spp.
b. Francisella spp.
c. Bartonella spp.
d. Brucella spp.

469. A farmer presenting with fever off and on for the past 4 years was diagnosed to be suffering from chronic Brucellosis. All of the following serological tests would be helpful in the diagnosis at this state except:

a. Standard agglutination test
b. 2-mercapto-ethanoI test
c. Complement fixation test
d. Coombs' test

470. Malta fever is caused by:

a. Borrelia burgdorferi
b. Brucella melitensis
c. Pseudomonas
d. Leigionella

471. A farmer rearing sheep, presented with complaints of fever and weakness for the last one month. There is generalized lymphadenopathy. There was also associated hepatomegaly Biopsy of liver showed non-caseating granuloma. There are most likely due to infection with:

a. Yersinia pestis
b. Brucella canis
c. Francisella tularensis
d. Brucella melitensis

472. Regarding Brucellosis, all of these are true except:

a. Man to man transmission
b. A zoonosis
c. Blood cultures used in diagnosis
d. Transmitted via animal products

473. All are true about brucella except:

a. B. abortus is capnophilic
b. Transmitted by aerosol can occur occasionally
c. Pasteurization destroys it
d. 2 ME is used to detect IgA

474. Milk ring test is for:

a. Brucellosis b. Bacteroides
c. Tuberculosis d. Salmonellosis

475. Hemophilus ducreyi causes

a. Lymphogranuloma venereum
b. Chancroid
c. Syphilis
d. Psittacosis

476. Satellitism is seen in culture of

a. Hemophilus b. Streptococcus
c. Klebsiella d. Proteus
e. Salmonella

464. a	465. b	466. d	467. d	468. d	469. a	470. b	471. d	472. a	473. d
474. a	475. b	476. a							

477. All of the following are virulence factors of pertussis, except:

a. Tracheal cytotoxin
b. Pertussis toxin
c. Capsule
d. Pertactin

478. All are Campylobacter culture media except:

a. Butzler's
b. CVA medium
c. Regan-Lowe medium
d. Skirrow's medium
e. Campylobacter blood agar

479. All are true statements about Campylobacter jejuni, except

a. Human is the only reservoir
b. Can cause GB syndrome
c. Poultry is the source of infection
d. Common cause of Campylobacteriosis

480. A 35 years old patient complaint of abdominal cramps along with profuse diarrhea. Treating physician wants to process the stool specimen for isolation of Campylobacter jejuni. Which of the following is method of choice for culture of stool?

a. Culture on TCBS media incubated at 37 °C on aerobic condition
b. Culture on Skirrow's medium incubated at 42°C under microaerophilic condition
c. Culture on Mac Conkeys medium incubated at 42°C under anaerobic condition
d. Culture on Wilson and Blair's medium at 37°C under microaerophilic condition

481. Helicobacter pylori is not associated with:

a. Gastrointestinal lymphoma
b. Gastric cancer
c. Gastric leiomyoma
d. Peptic ulcer

482. Which of following is false regarding H. pylori?

a. With chronic infection urea breath test become negative
b. H. pylori infection remains lifelong if untreated
c. Endoscopy is diagnostic
d. Toxigenic strains usually cause ulcer

483. True about H. pylori:

a. Seen in 85 to 90% cases of gastric ulcer
b. Seen in 20 to 25% cases of duodenal ulcer
c. Transmitted from man to man, Fecoorally and by oro- gastric route
d. Common in adults of developing countries

484. Microaerophilic bacteria:

a. Campylobacter
b. Vibrio cholera
c. Pseudomonas
d. Salmonella

485. Which of the following organism is strongly urease positive?

a. H. pylori
b. Proteus
c. Bordetella pertussis
d. Brucella

486. All of the following are true about Helicobacter pylori except:

a. About 50% of world population affected
b. 85% of population is affected, in some developing countries
c. All children in developing countries have immunity by five years of age
d. Infection is common in low socioeconomic status

487. True about Helicobacter pylori is:

a. Culture and gram staining of biopsy is the gold standard investigation
b. Controlled urea breath is negative with massive infection
c. Anti-urease antibody is produced only by invasive strains
d. Urease activity provides protective environment to the bacilli

477. c	478. c	479. a	480. b	481. c	482. a	483. c	484. a	485. a	486. c
487. d									

488. The most sensitive test for H. pylori is:

a. Breath test
b. Rapid urease test
c. Culture of biopsy
d. Microscopy of biopsy

489. H. pylori causes all except:

a. Gastric ulcer
b. Duodenal ulcer
c. Gastric cancer
d. Colorectal cancer

490. Which of the following is a selective media for Campylobacter?

a. MacConkeys Medium
b. Skirrow's medium
c. Buffered charcoal yeast agar
d. Chocolate agar

491. True about H. pylori includes all except:

a. Gram positive bacillus
b. Urease positive bacillus
c. Highly associated with duodenal ulcer
d. Urea breath test can be performed only in specialized labs

492. True about Campylobacter jejuni:

a. Exclusively found in jejunum only
b. Shows darting motility by peritrichous flagella
c. Can grow at temperature around 42°C
d. Common cause of diarrhea in India

493. Seven sheathed flagella is seen in:

a. V. cholerae
b. H. pylori
c. P. aeruginosa
d. Spirochetes

494. A 70 years old patient presents with high grade fever, dry cough and abdominal pain. Sputum sample collected from patient shows gram negative organisms that are able to grow only on charcoal yeast extract medium. The most likely organism is:

a. H. influenzae
b. Legionella
c. Listeria monocytogenes
d. M. catarrhalis

495. A 60-year old man is diagnosed to be suffering from Legionnaires disease after he returns home from attending a convention. He could have acquired it:

a. From a person suffering from the infection while traveling in the aeroplane
b. From a chronic carrier in the convention center
c. From inhalation of the aerosol in the air-conditioned room at convention center
d. By sharing an infected towel with a fellow delegate at the convention

496. Anju, a 28 years female, has diarrhea, confusion, high grade fever with bilateral pneumonitis. Organism causing this is:

a. Legionella
b. Neisseria meningitidis
c. Streptococcus pneumoniae
d. H. influenzae

497. All of the following are true regarding Legionella except:

a. Legionella can be grown on complex media
b. L. pneumophilia serogroup 1 is the most common sero- group isolated from humans
c. Legionella are communicable from infected patient to others
d. L. pneumophila is not effectively killed by polymorphonuclear leukocyte

498. Pontiac fever is caused by:

a. Listeria Monocytogenes
b. S. aureus
c. CI. tetani
d. Legionella pneumophila
e. Borrelia recurrentis

488. a	489. d	490. b	491. a	492. c	493. b	494. b	495. c	496. a	497. c
498. d									

499. An elderly patient presented with fever, chest pain and dry cough. Sputum cultured on charcoal yeast medium, the most likely organism is:

a. H. influenzae
b. Moraxella catarrhalis
c. Legionella
d. Burkholderia cepacia

500. Aerosol spread leading to epidemics is seen in infection with:

a. Legionella
b. Hemophilus
c. Influenza virus
d. Mycoplasma

501. Buffered charcoal yeast agar is the selective medium for:

a. Listeria monocytogenes
b. Legionella pneumophila
c. Pseudomonas aeruginosa
d. T. pallidum

502. Legionnaire disease is caused by:

a. Motile gram positive
b. Motile gram negative
c. Non-motile gram positive
d. Non-motile gram negative

503. Lice are not the vectors of:

a. Relapsing fever
b. Q fever
c. Trench fever
d. Epidemic typhus

504. All are true about scrub typhus, except:

a. Causative organism is R.tsusugamushi
b. Vector is trombiculid mite
c. Adult female feeds on vertebrate hosts
d. Tetracycline is the drug of choice

505. A patient complained of chills and fever following a louse bite 2 week before. He had rashes all over the body and was delirious at the time of presentation to the hospital and subsequently went into coma. A provisional diagnosis of vasculitis due to Rickettsial infection was made. Which one of the following can be the causative agent:

a. Rickettsia typhi
b. Rickettsia rickettsiae
c. Rickettsia prowazekii
d. Rickettsia akari

506. Scrub typhus is transmitted by:

a. Reduviid bug
b. Trombiculid mite
c. Enteric pathogens
d. Cyclops

507. It is true regarding endemic typhus that:

a. Man is the only reservoir of infection
b. Flea is a vector of the disease
c. The rash developing into eschar is a characteristic presentation
d. Culture of the etiological agent in tissue culture is a diagnostic

508. A man presents with fever, chills 2 weeks after a louse bite. There was maculopapular rash on the trunk which spread peripherally. The cause of this infection can be:

a. Scrub typhus
b. Endemic typhus
c. Rickettsial pox
d. Epidemic typhus

509. Disease caused by Orientia is transmitted by:

a. Rat flea b. Tick
c. Louse d. Trombiculid mite
e. Gamaxid mite

510. Tick is vector for: (PGI)

a. Crimean Congo fever
b. Rocky mountain spotted fever
c. Epidemic typhus
d. Endemic typhus
e. Scrub typhus

499. c	500. a	501. b	502. b	503. b	504. c	505. c	506. b	507. b	508. d
509. d	510. a,b								

511. In a patient with UTI; on smear, no bacteria are found on gram stain with abundant pus cells, to demonstrate organism, which of the following is useful:

a. McCoy cell line
b. Thayer martin medium
c. L. J. medium
d. Acid fast staining

512. Which of the following is not true regarding Chlamydia?

a. Has biphasic life
b. Elementary body is metabolically active
c. Reticulate body undergoes binary fission
d. Once it invades into cell it abates phagoloysosomal fusion

513. Which one of the following statements is true regarding Chlamydia pneumoniae?

a. Fifteen serovars have been identified as human pathogen
b. Mode of transmission is by the airborne bird excreta
c. The cytoplasmic inclusions presents in the sputum specimen are rich in glycogen
d. The group specific antigen is responsible for the production of complement fixing antibodies

514. A 45 years female complains of lower abdominal pain and vaginal discharge. On examination there is cervicitis along with a mucopurulent cervical discharge. The gram smear of the discharge shows presence of abundant pus cells but no bacteria. The best approach to isolate the possible causative agent would be:

a. Culture on chocolate agar supplemented with Hemin
b. Culture on McCoy cells
c. Culture on a bilayer human blood agar
d. Culture on Vero cell lines

515. A man presents to STD clinic with urethritis and urethral discharge. Gram stain shows numerous pus cells but no microorganism. Culture is negative on routine laboratory media. The most likely agent is:

a. Chlamydia trachomatis
b. H. ducreyi
c. T. pallidum
d. N. gonorrhoeae

516. Chlamydia trachomatis serovars D-K cause:

a. Arteriosclerosis
b. Trachoma
c. Lymphogranuloma venereum
d. Urethritis

517. Chlamydia causes: (PGI)

a. Infertility
b. Pneumothorax
c. Pelvic inflammatory disease
d. Congenital malformation in fetus

518. Isolation of Chlamydia from tissue specimen can be done by:

a. ELISA (Enzyme Linked Immune Assay)
b. Yolk sac inoculation
c. Direct Immunofluorescence Antibody test (DFA)
d. Polymerase Chain Reaction (PCR)

519. A male patient with symptoms of urethritis. Examination reveals only pus cells without any organism. Most likely cause is:

a. Chlamydia trachomatis
b. H. ducreyi
c. Treponema pallidum
d. M. tuberculosis

520. Most sensitive test for diagnosing chlamydia:

a. Gram's staining
b. Nucleic acid amplification testing
c. ELISA
d. Fluorescent microscopy

521. The primary site of multiplication of Rickettsial organisms is in the:

a. Parenchymal cells of the liver
b. Endothelial cells of small vessels
c. Media of arteries
d. Adventitia of all blood vessels

511. a	**512. b**	**513. d**	**514. b**	**515. a**	**516. d**	**517. a,c**	**518. b**	**519. a**	**520. b**
521. b									

522. Anthropozoonosis are all except: (PGI)
a. Guinea worm infection
b. Rabies
c. Plague
d. Hydatid cyst

523. Chlamydia cause all of the following except:
a. Trachoma
b. Non-gonococcal urethritis
c. Pneumonia
d. Parotitis
e. Pancreatitis

524. Chlamydia trachomatis causes all except:
a. Ophthalmia neonatorum
b. Lymphogranuloma venereum
c. Q-fever
d. Trachoma

525. "Genital elephantiasis" is seen in
a. Rickettsia
b. Chancroid
c. Lymphogranuloma venereum
d. Syphilis

526. Neil Mooser's reaction is given by:
a. Rickettsial infection
b. Chlamydial infection
c. Mycoplasma
d. Pneumococci infection

527. Microorganism that does not obey Koch's postulates:
a. M. tuberculosis
b. Poliovirus
c. M. leprae
d. Streptococcus

528. Chlamydia trachomatis, the causative agent for trachoma:
a. Is a yeast
b. Is an intracellular organism
c. Forms extracellular bodies which are metabolically active
d. Is never demonstrable in conjunctival scrapings

529. Causative agent of Q fever:
a. R. Quintana b. R. prowazekii
c. R. typhi d. Coxiella burnetii

530. For all of the following reaction Weil Felix reaction is diagnostic except:
a. Endemic typhus
b. Scrub typhus
c. Epidemic typhus
d. Q fever

531. Endemic typhus is transmitted by:
a. Rat flea b. Mite
c. Tick d. None

532. Following grows in the cell free medium:
a. Rickettsiae b. M. leprae
c. Bartonella d. T. pallidum

533. Transovarian transmission is seen in:
a. Rickettsiae b. Chlamydia
c. Both d. None

534. Vascular endothelial infection is caused by:
a. Rickettsiae b. Mycoplasma
c. Chlamydia d. None

535. All of the following are true about Chlamydia except:
a. Gram positive
b. Causes trachoma
c. Causative organism of psittacosis
d. Are also called basophilic viruses

536. Obligatory intracellular organism is:
a. Mycoplasma
b. Chlamydia
c. Cryptococcus
d. H. pylori

537. Well Felix reaction for Scrub typhus shows positivity for:
a. OXK b. OXK + OX19
c. OX-2 d. OX-19

538. Which of the following is used for Rickettsia:
a. Weil-Felix reaction
b. Rose-waller test
c. Paul-Bunnel test
d. VDRL

522. a,c	523. e	524. c	525. c	526. a	527. c	528. b	529. d	530. d	531. a
532. c	533. a	534. a	535. a	536. b	537. a	538. a			

539. Inclusion body is seen in:
a. Rickettsiae b. Chlamydia
c. Mycoplasma d. H. pylori

540. False +ve VDRL is seen in:
a. Lepromatous leprosy
b. Infectious mononucleosis
c. HIV
d. Pregnancy
e. All of the above

541. Chancre redux' is a clinical feature of:
a. Early relapsing syphilis
b. Late syphilis
c. Chancroid
d. Recurrent herpes simplex infection

542. Best indicator for monitoring of syphilis treatment:
a. VDRL b. FTA-ABS
c. TPI d. TPHA

543. A 25-year-old laborer presented 3 years back with penile ulcer which remain untreated. Later he presented with neurological symptoms for which he has taken appropriate treatment. Test to monitor response to treatment is:
a. VDRL b. TPI
c. FTA-Abs d. ELISA

544. Non-venereal treponemes is/are: (PGI)
a. T. pertenue b. T. carateum
c. T. pallidum d. T. cuniculi

545. A bacterial disease with 3 'R's i.e. rats, rice fields and rainfall is:
a. Leptospirosis
b. Plague
c. Melioidosis
d. Rodent bite fever

546. A sweeper involved with repair-work of sewers was admitted with fever, jaundice and renal failure. The most appropriate test to diagnose infection of this patients:
a. Weill-Felix test
b. Paul-Bunnell test
c. Microscopic agglutination test
d. Micro immunofluorescence test

547. The following statements are true regarding leptospirosis, except:
a. It is a zoonosis
b. Man is the dead end host
c. Man is an accidental host
d. Lice acts as reservoir of infection

548. 20-year-old boy has admitted with history of fever, icterus, conjunctival suffusion and hematuria for 20 days. Which of the following serological test can be of diagnostic utility:
a. Widal test
b. Microscopic agglutination test
c. Paul-Bunnell-test
d. Weil-Felix reaction

549. Not used for diagnosis of Leptospirosis:
a. Microscopic agglutination test
b. Dark field illumination
c. Macroscopic agglutination test
d. Weil Felix reaction

550. A 25-year-old farmer presented with history of high grade fever for 7 days and altered sensorium for 2 days. On examination, he was comatose and had conjunctival hemorrhage. Urgent investigations showed a hemoglobin of 11 gm/dl. Peripheral blood smear was negative for malarial parasite. What is the most likely diagnosis?
a. Brucellosis
b. Weil's disease
c. Acute viral hepatitis
d. Q fever

551. Lyme disease caused by:
a. Leptospira b. Borrelia
c. Treponema d. Bordetella
e. Arbovirus

552. Tick born relapsing fever is/are caused by: (PGI)
a. Borrelia recurrentis
b. Borrelia duttonii
c. Borrelia burgdorferi
d. Borrelia hermsii
e. None of above

539. b	540. e	541. a	542. a	543. a	544. a,b	545. a	546. c	547. d	548. b
549. d	550. b	551. b	552. b,d						

553. Test used for diagnosis of congenital syphilis:
a. IgM FTA - Abs
b. VDRL
c. TPI
d. Kahn flocculation test

554. The following is not true of syphilis:
a. TPI is most specific
b. VDRL is not specific
c. VDRL is negative in secondary syphilis
d. IgM test is specific for congenital syphilis

555. The causative agent of Lyme's disease:
a. Borrelia burgdorferi
b. Borrelia recurrentis
c. Leptospira icterohaemorrhagiae
d. Clostridium difficile

556. Organisms that has not been cultured successfully so far is:
a. Leptospira
b. Treponema pallidum
c. Bordetella
d. Staphylococcus

557. Yaws is caused by:
a. Treponema pallidum
b. Campylobacter jejuni
c. Salmonella
d. S. aureus

558. Genetic variations are important in:
a. Borrelia b. S. aureus
c. Leptospira d. Hemophilus

559. Which of the following disease is not caused by Treponema:
a. Yaws
b. Bejel
c. Relapsing fever
d. Syphilis

560. Syphilis was first identified by:
a. Frankel
b. Nicholas
c. Schaudinn and Hoffman
d. Ogston

561. Consider the following serological tests:
1. FTA-ABS 2. TPI
3.TPHA 4.VDRL

Which of these are specific for diagnosing syphilis?
a. 1 only b. 2 and 4
c. 3 and 4 d. 1,2 and 3

562. Which of the following is the most specific test to diagnose syphilis:
a. VDRL test b. Wassermann test
c. RPR d. FTA-ABS
e. TPPA

563. Dark ground microscopy is used for:
a. TPI b. FTA-ABS
c. Kahn's test d. VDRL

564. RPR is done for diagnosis of:
a. Malaria
b. Syphilis
c. Leishmaniasis
d. None

565. Antigenic mutation is seen in: (PGI)
a. Trypanosoma
b. Streptococcus
c. Borrelia
d. Leptospira

566. Incubation period of syphilis:
a. 1 hour - 5 hour
b. 24 hour - 48 hour
c. 1 day -10 days
d. 10 days - 90 days

567. Borrelia undergoes antigenic variation due to:
a. Plasmids
b. Transposons
c. Intrinsic mutation
d. All of the above

568. Leptospirosis is transmitted by:
a. Rat b. Cat
c. Dog d. Fish

553. a	554. c	555. a	556. b	557. a	558. a	559. c	560. c	561. d	562. e
563. a	564. b	565. a,c	566. d	567. a	568. a				

569. Reservoir of Leptospira:
a. Cat b. Dog
c. Rat d. Monkey

570. Stain for Treponema:
a. Fontana's
b. Acid-fast
c. Methenamine-silver
d. PAS

571. Confirmatory test for syphilis:
a. VDRL b. FTA-ABS
c. RPR d. None

572. True about B. recurrentis:
a. Causes leptospirosis
b. Water borne disease
c. Vector borne disease
d. Transmitted by tick

573. All of them are features of Ureaplasma urealyticum except:
a. Non-gonococcal urethritis
b. Salpingitis
c. Epididymitis
d. Bacterial vaginosis
e. All of the above

574. In reference to Mycoplasma, the following are true except:
a. They are inhibited by Penicillins
b. They can reproduce in cell free media
c. They have an affinity for mammalian cell membranes
d. They can pass through fitters of 450 nm pore size

575. Positive cold agglutination test is seen in infections with:
a. Mycoplasma
b. Chlamydia
c. Infectious mononucleosis
d. Varicella

576. Cell wall deficient organisms are:
a. Chlamydia
b. Mycoplasma
c. Streptococcus
d. Anaerobes

577. Diene's method is used for:
a. Mycoplasma b. Chlamydiae
c. Plague d. Diphtheria

578. True about mycoplasma:
a. Obligate intracellular organism
b. Penicillin is effective treatment
c. Require cholesterol for growth
d. Have thick cell wall

579. HACEK group includes all of the following except:
a. Hemophilus aphrophilus
b. Acinetobacter baumanni
c. Eikenella corrodens
d. Cardiobacterium hominis

580. Ehrlichia chaffeensis is causative agents of:
a. HME
b. HGE
c. Glandular fever
d. None

569. c	570. a	571. b	572. c	573. e	574. a	575. a	576. b	577. a	578. c
579. b	580. a								

168. A -O 157: H7

- Certain enterohemorrhagic strains of *E. coli* (i.e., those with the O157:H7 serotype) also cause bloody diarrhea by producing an exotoxin called **Shiga toxin,** so called because it is very similar to that produced by *Shigella* species.
- Shiga toxin acts by removing an adenine from the large (28S) ribosomal RNA, thereby stopping protein synthesis.
- Shiga toxin is encoded by temperate (lysogenic) bacteriophages. Shiga toxin is also called verotoxin because it has a cytopathic effect on Vero (monkey) cells in culture.

169. D -Mycoplasma

170. C- Ludwig's angina

171. B- Calymmatobacterium granulomatis

- A clinical diagnosis of donovanosis is made by an experienced practitioner on the basis of the lesion's appearance and usually has a high positive predictive value.
- Then diagnosis is confirmed by microscopic identification of Donovan bodies in tissue smears.
- Preparation of a good-quality smear is important.
- If donovanosis is suspected on clinical grounds, the smear for Donovan bodies should be taken before swab samples to be tested for other causes of genital ulceration so that enough material can be collected from the ulcer.
- A swab should be rolled firmly over an ulcer previously cleaned with a dry swab to remove debris.
- Smears can be examined in a clinical setting by direct microscopy with a rapid Giemsa or Wright's stain.

172. D-Weil felix reaction

Weil felix reaction is a heterophile agglutination reaction used for presumptive diagnosis of rickettsial infections.

173. B-Gastric (MALT) lymphoma

Helicobacter pylori colonizes the stomachs of ~50% of the world's human population throughout their lifetimes. Colonization with this organism is the main risk factor for peptic ulceration as well as for gastric adenocarcinoma and gastric MALT (mucosa associated lymphoid tissue) lymphoma .

174. B -Leptospira interrogans

Weil's disease or ictero-haemorrhagic fever is a severe form of leptospirosis caused by L.interrogans.

175. A- Gardnerella vaginalis

Bacterial vaginosis is alteration in normal vaginal flora with decrease in Lactobacilli and increase in Gardnerella vaginalis.

176. D -Pseudomonas

- P. aeruginosa infections of the ears vary from mild swimmer's ear to serious life-threatening infections with neurologic sequelae.
- Swimmer's ear is common among children and results from infection of moist macerated skin of the external ear canal.
- Most cases resolve with treatment, but some patients develop chronic drainage.
- Swimmer's ear is managed with topical antibiotic agents (otic solutions).

177. B- Most commonly causes diarrhea in developing countries

In tropical or developing countries, ETEC is a major cause of endemic diarrhoea.

178. C- Most important toxin is hyaluronidase

Most important enzyme of C.perfringens is lecithinase/phospholipase C.

179. C- Anthrax of skin

Malignant pustule is a manifestation of cutaneous anthrax (Hide porter's disease).

180. C- Capsular polypeptide protein is responsible for virulence

Capsular polysaccharide is a virulence factor and it is made of polyribosyl ribitol phosphate (PRP) in serotype b.

181. B -More common in winters and dry weather

- C. tetani is an anaerobic, gram-positive, spore-forming rod whose spores are highly resilient and can survive readily in the environment throughout the world.
- Spores resist boiling and many disinfectants.
- In addition, C. tetani spores and bacilli survive in the intestinal systems of many animals, and fecal carriage is common.
- The spores or bacteria enter the body through abrasions, wounds, or (in the case of neonates) the umbilical stump.
- Once in a suitable anaerobic environment, the organisms grow, multiply, and release tetanus toxin, an exotoxin that enters the nervous system and causes disease.
- Very low concentrations of this highly potent toxin can result in tetanus (minimum lethal human dose, 2.5 ng/kg).
- There is no seasonal predilection.

182. B- VDRL

VDRL becomes negative with successful treatment, hence is used as a prognostic test.

183. B -Presence of Pain abdomen

184. B -Clostridium difficile

- Clostridium difficile infection (CDI) is a unique colonic disease that is acquired almost exclusively in association with antimicrobial use and the consequent disruption of the normal colonic flora.
- The most commonly diagnosed diarrheal illness acquired in the hospital, CDI results from the ingestion of spores of C. difficile that vegetate, multiply, and secrete toxins, causing diarrhoea and pseudomembranous colitis (PMC).

185. B- Chlamydia

186. A -Calymmatobacterium granulomatis

- Donovanosis is a chronic, progressive bacterial infection that usually involves the genital region.
- The condition is generally regarded as a sexually transmitted infection of low infectivity.
- This infection has been known by many other names, the most common being granuloma inguinale .
- The causative organism has been reclassified as Klebsiella granulomatis comb nov on the basis of phylogenetic analysis, although there is ongoing debate about this decision.
- Some authorities consider the original nomenclature (Calymmatobacterium granulomatis), which is based on analysis of 16S rRNA gene sequences, to be more appropriate.

187. D -M.ulcerans

- M. ulcerans, another waterborne skin pathogen, is found mainly in the tropics, especially in tropical areas of Africa.
- It causes Buruli ulcer.
- Infection follows skin trauma or insect bites that allow admission to contaminated water.
- The skin lesions are typically painless, clean ulcers that slough and can cause osteomyelitis.
- The toxin mycolactone accounts for the modest host inflammatory response and the painless ulcerations.

188. B-Herpes genitalis, D- chancroid

189. A- Chlamydia psittaci

Psittacosis in humans may present as acute primary atypical pneumonia (which can be fatal in up to 10% of untreated cases); as severe chronic pneumonia; or as a mild illness or asymptomatic infection in persons exposed to infected birds.

190. D- diphtheria

Corynebacterium diphtheriae does not have any animal reservoir, it is a human pathogen. Other options have animal reservoirs.

191. B- Borrelia burgdorferi

Lyme borreliosis is caused by a spirochete, Borrelia burgdorferi sensu lato , that is transmitted by ticks of the Ixodes ricinus complex.

192. A -Myocardial necrosis

- Listeriosis in pregnancy is a severe and important infection.
- The usual presentation is a nonspecific acute or subacute febrile illness with myalgias, arthralgias, backache, and headache.
- Pregnant women with listeriosis are usually bacteremic.
- This syndrome should prompt blood cultures, especially in the absence of another reasonable explanation.
- Involvement of the CNS is rare in the absence of other risk factors.
- Preterm delivery is a common complication, and the diagnosis may be made only postpartum.
- As many as 70–90% of foetuses from infected women can become infected.
- Prepartum treatment of bacteremic women enhances the chances of delivery of a healthy infant.
- Women usually do well after delivery: maternal deaths are very rare, even when the diagnosis is made late in pregnancy or postpartum.
- Overall mortality rates for fetuses infected in utero approach 50% in some series; among live-born neonates treated with antibiotics, mortality rates are much lower (~20%).
- Granulomatosis infantiseptica is an overwhelming listerial fetal infection with miliary microabscesses and granulomas, most often in the skin, liver, and spleen.
- Less severe neonatal infection acquired in utero presents at birth.
- "Late-onset" neonatal illness typically develops ~ 10–30 days postpartum.
- Mothers of infants with late onset disease are not ill.
- L. monocytogenes causes ~ 5–10% of all cases of community acquired bacterial meningitis in adults in the West.
- It does not cause myocardial necrosis.

193. D -leptospirosis

Leptospirosis is also known as Sewer worker's disease.

194. C- Tetanus

Tetanus is not transmissible from person to person.

195. D- Gonococcus

- The vaginal mucosa of healthy women is lined by stratified squamous epithelium and is rarely infected by N. gonorrhoeae.
- However, gonococcal vaginitis can occur in anestrogenic women (e.g., prepubertal girls and postmenopausal women), in whom the vaginal stratified squamous epithelium is often thinned down to the basilar layer, which can be infected by N. gonorrhoeae.
- The intense inflammation of the vagina makes the physical (speculum and bimanual) examination extremely painful.
- The vaginal mucosa is red and edematous, and an abundant purulent discharge is present.
- Infection in the urethra and in Skene's and Bartholin's glands often accompanies gonococcal vaginitis.
- Inflamed cervical erosion or abscesses in nabothian cysts may also occur.
- Coexisting cervicitis may result in pus in the cervical os.

196. B- LGV

197. B- Malaria, C-Leishmaniasis, D-Tropical eosinophilia

- Biological false-positive (BFP) reactions:
- BFP reactions are defined as positive results in non treponemal tests, with negative results in treponemal tests, in the absence of syphilis and not caused by technical faults.
- Cardiolipin antigen being non-specific may react with the sera of patients suffering from unrelated diseases but not having syphilis.
- Reagin antibodies are induced against the cardiolipin antigen present in T.pallidum or similar lipid haptens released from damaged host tissues.
- BFP reactions may occur in about 1 % of normal sera.
- BFP antibody is usually of IgM type, while regain antibody in syphilis is mainly IgG.
- BFP reactions may be seen in the conditions such as lepromatous leprosy, relapsing fever, malaria, tropical pulmonary eosinophilia, viral hepatitis, infectious mononucleosis, HIV, pregnancy and IV drug abusers.

198. A -Q fever

- Q fever is the one rickettsial disease that is *not* transmitted to humans by the bite of an arthropod.
- The important reservoirs for human infection are cattle, sheep, and goats.
- The agent, *C. burnetii*, which causes an inapparent infection in these reservoir hosts, is found in high concentrations in the urine, feces, placental tissue, and amniotic fluid of the animals.
- It is transmitted to humans by **inhalation of aerosols** of these materials.
- The disease occurs worldwide, chiefly in individuals whose occupations expose them to livestock, such as shepherds, abattoir employees, and farm workers.
- Cow's milk is usually responsible for subclinical infections rather than disease in humans.
- Pasteurization of milk kills the organism.

199. C- Donovanosis

200. A -Staphylococci

- Scalded-skin syndrome is characterized by fever, large bullae, and an erythematous macular rash.
- Large areas of skin slough, serous fluid exudes, and electrolyte imbalance can occur.
- Hair and nails can be lost.
- Recovery usually occurs within 7–10 days.
- This syndrome occurs most often in young children.

201. D- Listeria

- Granulomatosis infantiseptica is an overwhelming listerial fetal infection with miliary microabscesses and granulomas, most often in the skin, liver, and spleen.
- Less severe neonatal infection acquired in utero presents at birth.

202. A -Staphylococcus aureus

203. C -Bacillus anthracis

204. C -Mycoplasma

Eaton's agent: It refers to the most pathogenic species i.e. Mycoplasma pneumoniae; which was first isolated by Monroe Eaton (1944).

205. A -Staphylococcus aureus

- Osteomyelitis and septic arthritis may arise either by hematogenous spread from a distant infected focus or be introduced locally at a wound site.
- S. aureus is a very common cause of these diseases, especially in children.

206. D -Viridans streptococci

- Subacute bacterial endocarditis (SABE): Viridans streptococci are the most common cause of SABE.
- The commensal viridans streptococci (S. sanguis) in the oral cavity can enter blood to cause transient bacteraemia while chewing, tooth brushing and dental procedures that can account for the predilection of these organisms to cause endocarditis.

207. D -Salmonella typhimurium

Normal gut flora are indicators of faecal pollution of water, not gut pathogens.

208. C -Scrub typhus

Scrub typhus is transmitted by trombiculid mite.

209. B -Group B streptococcus

GBS is the most common cause of neonatal septicemia and neonatal meningitis in the West.

210. D- C. minutissimum

Erythrasma is a cutaneous infection producing reddish brown, macular, scaly, pruritic intertriginous patches.

- The dermatologic presentation under the Wood's lamp is of coral-red fluorescence. C. minutissimum appears to be a common cause of erythrasma, although there is evidence for a polymicrobial etiology in certain settings.
- In addition,this fluorescent microbe has been associated with bacteremia in patients with hematologic malignancy.
- Erythrasma responds to topical erythromycin, clarithromycin, clindamycin, or fusidic acid, although more severe infections may require oral macrolide therapy.

211. D- Cutaneous anthrax

Cutaneous anthrax is also known as Hide porter's disease.

212. C -Gastric leiomyoma

- Helicobacter pylori colonizes the stomachs of ~50% of the world's human population throughout their lifetimes.
- Colonization with this organism is the main risk factor for peptic ulceration as well as for gastric adenocarcinoma and gastric MALT (mucosa associated lymphoid tissue) lymphoma .

213. B- Staphylococcus aureus

214. C- Pseudomonas aeruginosa

- The most serious form of Pseudomonas infection involving the ear has been given various names: two of these designations, malignant otitis externa and necrotizing otitis externa, are now used for the same entity.
- This disease was originally described in elderly diabetic patients, in whom the majority of cases still occur.
- However, it has also been described in patients with AIDS and in elderly patients without underlying diabetes or immunocompromise.
- The usual presenting symptoms are decreased hearing and ear pain, which may be severe and lancinating.
- The pinna is usually painful, and the external canal may be tender.
- The ear canal almost always shows signs of inflammation, with granulation tissue and exudate.
- Tenderness anterior to the tragus may extend as far as the temporomandibular joint and mastoid process.
- A small minority of patients have systemic symptoms.
- Patients in whom the diagnosis is made late may present with cranial nerve palsies or even with cavernous venous sinus thrombosis.
- The ESR is invariably elevated (≥100 mm/h).
- The diagnosis is made on clinical grounds in severe cases; however, the "gold standard" is a positive technetium-99 bone scan in a patient with otitis externa due to P. aeruginosa.
- In diabetic patients, a positive bone scan constitutes presumptive evidence for this diagnosis and should prompt biopsy or empirical therapy.

215. C- Transcription

Three methods of horizontal gene transfer in bacteria are transformation, transduction and conjugation.

216. B -Typhoid

- The most prominent symptom in typhoid is prolonged fever (38.8°–40.5°C; 101.8–104.9 degree Farenheit), which can continue for up to 4 weeks if untreated.

- Early physical findings of enteric fever include rash ("rose spots"; 30%), hepatosplenomegaly (3–6%), epistaxis, and relative bradycardia at the peak of high fever (<50%).
- In 15–25% of cases, leukopenia and neutropenia are detectable.
- Leukocytosis is more common among children, during the first 10 days of illness, and in cases complicated by intestinal perforation or secondary infection.

217. A -Salmonella typhimurium

BACTERIAL FOOD POISONING

Incubatioin Period, Organism	Symptoms	Common Food Sources
1-6 h		
Staphylococcus aureus	Nausea, vomiting, diarrhea	Ham, poultry, potato or egg salad, may-onnaise, cream pastries
Bacillus cereus	Nausea, vomiting, diarrhea	Fried rice
8-16 h		
Clostridium perfringens	Abdominal cramps, diarrhea (vomiting rare)	Beef, poultry, legumes, gravies
B. cereus	Abdominal cramps, diarrhea (vomiting rare)	Meats, vegetables, dried beans, cereals
> 16 h		
Vibrio cholerae	Watery diarrhea	Shellfish, water
Enterotoxigenie Escherichia coli	Watery diarrhea	Salads, cheese, meats, water
Enterohemorrhagic E. coli	Bloody diarrhea	Ground beef, roast beef, salami, raw milk, raw vegeta- bles, apple juice
Salmonella spp.	Inflammatory diarrhea	Beef, poultry, eggs, dairy products
Campylobacter jejuni	Inflammatory diarrhea	Poultry, raw milk
Shigella spp.	Dysentery	Potato or egg salad, lettuce, raw vegetables
Vibrio parahaemolyticus	Dysentery	Mollusks, crustaceans

218. A- Strict aerobe

- Mycobacteria are aerobic, acid-fast bacilli (rods).
- They are neither gram-positive nor gram-negative (i.e., they are stained poorly by the dyes used in Gram stain).
- They are virtually the only bacteria that are acid-fast. (One exception is Nocardia asteroides, the major cause of nocardiosis, which is also acid-fast.)
- The term acid-fast refers to an organism's ability to retain the carbol fuchsin stain despite subsequent treatment with an ethanol–hydrochloric acid mixture.
- The high lipid content (approximately 60%) of their cell wall makes mycobacteria acid-fast.

219. A- FTA-Abs

Non treponemal tests are used to monitor response to treatment in syphilis.

220. A- Clostridium tetani

Swarming is shown by C.tetani, Proteus, Bacillus cereus.

221. B- Gram stain

Spirochaetes are too slender to be seen on gram stain.

222. D- V. cholerae

V. cholerae and V.mimicus are non-halophilic vibrios.

223. C- Listeria monocytogenes

224. B -Endemic relapsing fever

Endemic relapsing fever is transmitted by soft tick.

225. C -Rickettsia prowazekii

Recrudescent typhus is also known as Brill Zinsser's disease.

226. C -Transduction

- β lactamase or penicillinase enzymes cleave the β lactam rings, and there by organism producing this enzyme develops resistance to β lactam antibiotics.
- This resistance is plasmid coded, can be transferred between S. aureus strains by transduction.
- It is produced by >90% of strains of S. aureus.
- This resistance can be overcome by addition of β lactamase inhibitors such as clavulanic acid or sulbactam.

227. D- Escherichia coli

Escherichia coli is the most common cause of community acquired and nosocomial UTI.

228. D- It is a gram negative rod that does not ferment lactose

C.perfringens is a gram positive, anaerobic, spore-forming rod.

229. C- The species of Leptospira that cause leptospirosis grow primarily in humans and are usually transmitted by human to human contact.

Leptospira has many mammals as animal reservoirs, most important being rodents. It is not a primary human pathogen. Leptospirosis is a zoonotic disease, not transmissible from person to person.

230. B- Trench fever

Trench fever is transmitted by louse.

231. A- Group B streptococcus

CAMP test is used for identification of GBS and Listeria monocytogenes.

232. D- Calymmatobacterium granulomatis

Donovanosis:

- The incubation period is usually 1–4 weeks but may extend to 1 year.
- Skin lesions have been detected in infants 6 weeks to 6 months after birth.
- The disease begins as one or more subcutaneous nodules that erode through the skin to produce clean, granulomatous, sharply defined, usually painless lesions .
- These lesions, which bleed readily on contact, slowly enlarge.
- The genitalia are involved in 90% of cases, the inguinal region in 10%, and the anal region in 5–10%.
- Genital swelling, particularly of the labia, is a common feature and occasionally progresses to pseudoelephantiasis.

233. D- Mycobacterium

234. D- Malignant pustule

McFadyean reaction is used to demonstrate capsular material of Bacillus anthracis.

235. A- Staphylococcus

- P-V leukocidin is a pore-forming toxin that kills cells, especially white blood cells, by damaging cell membranes.
- The two subunits of the toxin assemble in the cell membrane to form a pore through which cell contents leak out.
- The gene encoding P-V leukocidin is located on a lysogenic phage.
- The importance of P-V leukocidin as a virulence factor is indicated by the severe skin and soft tissue infection caused by MRSA strains that produce this leukocidin.
- A severe necrotizing pneumonia is also caused by strains of S. aureus that produce P-V leukocidin.
- Approximately 2% of clinical isolates of S. aureus produce P-V leukocidin.

236. B- L. monocytogenes

Anton's test is a test for demonstrating the invasive property of *L.monocytogenes*.

237. A- hot air oven

238. B- Streptococcus pneumoniae

239. B -Bacillus anthracis

Considering the clinical features and morphology of the organism mentioned in the question, it is a case of inhalational anthrax or wool sorter's disease.

240. C- Borrelia hermsii

241. A- Yersinia pestis

Considering the clinical features and morphology of the organism mentioned in the question, it is a case of septicemic plague.

242. D- Ixodes species

243. C- Streptococcus pyogenes

- Streptolysin O is a hemolysin that is inactivated by oxidation (oxygen labile).
- It causes β-hemolysis only when colonies grow under the surface of a blood agar plate.
- It is antigenic, and antibody to it (ASO) develops after group A streptococcal infections.
- The titer of ASO antibody can be important in the diagnosis of rheumatic fever.

244. A- Ingestion of preformed exotoxin

- Food poisoning (gastroenteritis) is caused by ingestion of enterotoxin, which is preformed in foods and hence has a short incubation period (1–8 hours).
- In staphylococcal food poisoning, vomiting is typically more prominent than diarrhoea.

245. A- Elementary Body

- Chlamydiae have a replicative cycle different from that of all other bacteria.
- The cycle begins when the extracellular, metabolically inert, "sporelike" elementary body enters the cell and reorganizes into a larger, metabolically active reticulate body .
- The latter undergoes repeated cycles of binary fission to form daughter reticulate bodies, which then develop into elementary bodies, which are released from the cell. Within cells, the site of replication appears as an inclusion body, which can be stained and visualized microscopically .

These inclusions are useful in the identification of these organisms in the clinical laboratory.

246. C- Both Syphilis and Lyme disease

247. A- Streptococcus

248. D-4.0×10^3

At the end of first 10 minutes(lag phase), number remains the same. Bacterial number multiplies in next 10 minutes and again doubles in subsequent ten minutes.

249. B- Prognosis

Lepromin test assess CMI, it is used as a prognostic test.

250. C- Subacute endocarditis caused by Streptococcus bovis

- *S. bovis*, a nonenterococcal group D streptococcus, causes **endocarditis,** especially in patients with carcinoma of the colon.
- This association is so strong that patients with *S. bovis*, bacteremia, or endocarditis should be investigated for the presence of colonic carcinoma.

251. D- Demonstration of toxin production by a suspicious isolate

Toxigenicity tests are confirmatory for diphtheria.

252. A- EIEC

- EIEC shares many genetic and clinical features with *Shigella*; however, unlike *Shigella*, EIEC produces disease only at a large inoculum (10^8–10^{10} CFU), with onset generally following an incubation period of 1–3 days.
- Initially, enterotoxins are believed to induce secretory small-bowel diarrhoea.

- Subsequently, colonization and invasion of the colonic mucosa, followed by replication therein and cell-to-cell spread, result in the development of inflammatory colitis characterized by fever, abdominal pain, tenesmus, and scant stool containing mucus, blood, and inflammatory cells.
- Symptoms are usually self-limited (7–10 days).

253. B- Disc diffusion method

M.tuberculosis is very slow-growing(generation time being 20 hours),hence disc diffusion is not used for AST.

254. D- Sensitive to gentamicin

255. A- hyperproduction of beta-lactamases by borderline oxacillin-resistant strains of S. aureus

256. C- Siderophores

257. A- CA-MRSA is more virulent & less resistant

Types of MRSA

Community associated MRSA (CA-MRSA)	Hospital associated MRSA (HA-MRSA)
These strains express mecA gene subtype IV, V, VI.	These strains express mecA gene subtype I, II, III.
They are usually more virulent and express several toxins such as Pan ton Valentine (PV) toxin.	They are multidrug resistant I but their virulence is relatively low).
They cause invasive skin and soft tissue infections such as necrotizing fasciitis.	They cause perioperative wound infections in hospitals and nosocomial outbreaks (hospital staff are the major carries).

Note: CA-MRSA and HA- MRSA terminologies are becoming artificial nowadays; as many CA MRSA strains have been isolated in hospitalsand vice-versa.

258. C- S. sonnei

S. sonnei (group D) : It is antigenically homogeneous and has only one serotype. It can be typed by colicin typing into 26 colicin types.

259. B- Colicin typing

260. A- Slide coagulase test detects coagulase enzyme

- Coagulase enzyme combines with a plasma protein called CRF (coagulase reacting factor), and together they activate prothrombin, which in turn, converts fibrinogen to fibrin.
- This is the basis of tube coagulase test. This has to be differentiated from slide coagulase test, which is mediated by clumping factor .
- Coagulase can react with rabbit or human plasma; but does not clot with guinea pig plasma as it lacks CRF.

261. D- Automated antimicrobial susceptibility test

262. B-8-16 µg/ml

263. C- Fibrinogen binding protein

Staphylococcus epidermidis:

It is the most common CoNS (75-80%) isolated from clinical samples. It is present as normal flora on the skin, oropharynx and vagina; however, its pathogenic role is greatly enhanced in presence of prosthetic-devices.

Pathogenesis: S. epidermidis involves a two step process:

1. Initial adhesion to the prosthetic device: The surface adhesins of the organism bind to host serum or tissue constituents; such as fibrinogen or fibronectin., coated on the implanted prosthetic surfaces.

2. Colonization: S.epidermidis can produce the extracellular polysaccharide material (glycocalyx or slime) that facilitates formation of a protective biofilm on the device surfaces. Biofilm appears to act as a barrier, protecting bacteria from host defence mechanisms as well as from antibiotics.

264. B- M protein

265. C- Streptokinase is produced from serotype A, C, K

266. D-80% isolates are intermediate resistance to penicillin

- Except for strains that cause conjunctivitis, nearly every clinical isolate of S. pneumoniae has a polysaccharide capsule, a structure that renders the bacteria virulent by preventing phagocytosis.
- Empyema is the most common complication of pneumococcal pneumonia, occurring in ~2% of cases.
- The name Austrian's syndrome is given to the concurrence of pneumococcal pneumonia, endocarditis, and meningitis.
- At present, ~20% of pneumococcal isolates in the United States exhibit intermediate resistance to penicillin [minimal inhibitory concentration (MIC) 0.1–1.0 μg/mL], and 15% are resistant (MIC ≥2.0 (μg/mL).
- The rate of resistance is lower in countries that, by tradition, are conservative in their antibiotic use (e.g., Holland and Germany) and higher in countries where usage is more liberal (e.g., France).
- In Hong Kong and Korea, resistance rates approach 80%.

267. A- Viridans streptococci

- Subacute bacterial endocarditis (SABE): Viridans streptococci are the most common cause of SABE.
- The commensal viridans streptococci (S. sanguis) in the oral cavity can enter blood to cause transient bacteraemia while chewing, tooth brushing and dental procedures that can account for the predilection of these organisms to cause endocarditis.

268. C- Enterococci

269. A- Inducible high level resistance to Vancomycin & Teicoplanin

- Vancomycin-resistant enterococci (VRE), first reported from clinical sources in the late 1980s, have become common in many hospitals.
- Three major vancomycin resistance phenotypes have been described: VanA, VanB, and VanC. The VanA phenotype is associated with high level resistance to vancomycin and to teicoplanin.
- VanB and VanC strains are resistant to vancomycin but susceptible to teicoplanin, although teicoplanin resistance may develop during treatment in VanB strains.

270. A- Defect of the Btk gene

X-Linked Hypogammaglobulinemia (Bruton's Agammaglobulinemia):

- Very low levels of all immunoglobulins (IgG, IgA, IgM, IgD, and IgE) and a virtual absence of B cells are found in young boys; female carriers are immunologically normal.
- Pre-B cells are present, but they fail to differentiate into B cells.
- This failure is caused by a mutation in the gene encoding tyrosine kinase, an important signal transduction protein.
- Cell-mediated immunity is relatively normal.
- Clinically, recurrent pyogenic bacterial infections (e.g., otitis media, sinusitis, and pneumonia caused by Streptococcus pneumoniae and Haemophilus influenzae) occur in infants at about 6 months of age, when maternal antibody is no longer present in sufficient amount to be protective.
- Treatment with pooled gamma globulin reduces the number of infections.

271. B- M proteins

272. C- Ab is found to be useful for diagnosis

273. D- RFLP & IS fingerprinting

Genotypic methods are more commonly used for the typing of M. tuberculosis:

- PCR-RFLP (Restriction fragment length polymorphism) is used to detect variations in IS6110 gene.
- Spoligoyping: This is based on detecting the polymorphisms in DR locus (direct repeat) of M.

tuberculosis genome. It is more useful in strains having no or few copies of IS6110 gene.

- Pulse filed gel electrophoresis (PFGE).
- DNA sequencing.

274. D-γIFN release assay

- There are two approaches to the diagnosis of latent infections.
- One is the PPD skin test.
- Because there are problems both in the interpretation of the PPD test and with the person returning for the skin test to be read, a quantifiable laboratory-based test is valuable.
- This laboratory test is an interferon-γ release assay (IGRA), and there are two versions available: Quantiferon-TB and T-spot.TB.
- In this assay, blood cells from the patient are exposed to antigens from M. tuberculosis, and the amount of interferon-γ released from the cells is measured.
- The sensitivity and specificity of the IGRA are as good as the PPD skin test.
- Because the antigens used in the test are specific for M. tuberculosis and are not present in BCG, the test is not influenced by whether a person has been previously immunized with the BCG vaccine.

275. D- Ferment lactose, produce acid and gas

Members of the family Enterobacteriaceae should have the following properties:

- They are gram-negative bacilli.
- Aerobes and facultative anaerobes.
- Nonfastidious. can grow in ordinary media like nutrient agar.
- Ferment glucose to produce acid with or without gas.
- Reduce nitrate to nitrite.
- They produce catalase (except Shigella dysenteriae type-I).
- They do no produce oxidase.
- They are generally motile with peritrichous flagella, except some members which are non motile, such as Shigella and Klebsiella.
- Natural habitat: Most of them are commensals in human intestine, called coliform bacilli, e.g. Escherichia, Klebsiella, Proteus, Morganella, Providencia and Citrobacter, etc.The exceptions are Shigella, Salmonella which are enteric pathogens not commensals.

276. D-2 ME is used to detect IgA

2-mercaploelhanol (2ME) agglutination test: Here, the serum is treated with disulphide reducing agents such as 2-ME so that it destroys the agglutinability of lgM, but does not alter IgG. SAT performed in 2ME treated serum, would detect only IgG.

277. B- Cystitis caused by mostly the strains which carry K Ag

Capsular or K antigen (K for Kapsel, German for capsule):

- It is the polysaccharide capsular antigen present on the envelope or microcapsule o f a few strains of E.coli.
- When present, it encloses the O antigen and renders the strain inagglutinable by the O antiserum.

It may also contributes to virulence by inhibiting phagocytosis.

It is expressed by only few strains o f E.coli e.g. those causing neonatal meningitis, pyelonephritis and septicaemia.

278. D- Serial passage in rabbit reduces the virulence of the spirochete to human being

279. C- Infection is transmitted by bite in both

Louse-Borne Relapsing Fever:

- Body lice (Pediculus humanus var. corporis) become infected with B. recurrentis by feeding on spirochetemic humans, the only reservoirs of infection.
- In lice, B. recurrentis spirochetes are found almost exclusively in the hemolymph; humans acquire

infection when body lice are crushed and their infective fluids enter breaks in the skin, typically abrasions caused by scratching of pruritic louse bites.

- Spirochetes are not transmitted directly by the bite of a louse (anterior station transmission) but may possibly be transmitted in a manner similar to epidemic typhus by percutaneous inoculation of louse feces (posterior station transmission).
- Lice have a life span of only a few weeks, feed at frequent intervals, and survive only a few days off the human host.
- Typically, body lice reside in seams of clothing and bedclothes, where they deposit their eggs (nits).
- Head lice have not been shown to be vectors of LBRF.

Tick-Borne Relapsing Fever:

- Argasid ticks of the genus Ornithodoros transmit TBRF through their saliva and excreta when they take blood meals.
- Ticks typically become infected with TBRF borreliae as part of a zoonotic cycle when they feed on spirochetemic rodents and lagomorphs; the exception is O. moubata, a tick species that is thought to acquire B. duttoni only by feeding on infected humans.
- Ticks transmit TBRF borreliae vertically from one stage to the next; in some species, infection is transmitted transovarially over several generations.
- Soft ticks are hardy and can survive for as long as 10 years with only an occasional blood meal.
- These ticks feed painlessly, relatively quickly (for 20–45 min), and usually at night while hosts are sleeping.
- Thus patients with TBRF are often unaware of tick exposures.

280. C- Lysogeny

- Lysogenic conversion: infection with a bacteriophage to Salmonella may cause loss, gain or change of an O antigen.
- S. Anatum is converted into S. Newington by infection with one phage (gaining O15 antigen) and the latter into S. Minneapolis by another phage infection (gaining O34 antigen).

281. B- H-O variation is due to total loss of flagella

282. C- Escherichia coli

283. C- Form chalky granular clump in widal test

O antigen	H antigen
Somatic antigen It is a part of cell wall lipopolysaccharide (LPS)	Flagellar antigen • Made up of proteins flagellin • It confers moti lity to the bacteria
Heat stable Alcohol stable	Heat labile. Alcohol labile
Formaldehyde labile	Formaldehyde stable
In Widal test, O antigen of S.Typhi is used	In Widal test, H antigens of S.Typhi. S.Paratyphi A and B are used
O Ag is less immunogenic	HAg is more immunogenic
O antibody appears early, disappears early: indicates recent infection	H antibody appears late, disappears late: indicates convalescent stage
When Oantigen reacts with O antibody forms compact, granular, chalky clumps • Agglutination takes place slowly • Optimum temperature for agglutination is 55°C	When H antigen reacts with H antibody forms large, loose fluffy clumps. • Agglutination takes place rapidly. • Optimum temperature for agglutination is 37°C
Serogrouping of salmonellae is based on the Oantigen	Serogroups are differentiated into serotypes based on H antigen.
O antigen is also called the Boivin antigen because it can be extracted from the bacterial cell by treatment with trichloracetic acid – this property was first shown by Roivin	• Flagellar antigens exist in two alter nati ve phases Phase 1 and II. • Most of them are biphasic except 5l Typhi which is monophasic.

284. C- Bacillus brevis

285. B- Legionella pneumophila

- Cell-mediated immunity is the primary mechanism of host defense against Legionella, as it is against other intracellular pathogens.
- Thus Legionnaires' disease is more common and its manifestations are more severe among patients with depressed cell-mediated immunity.
- The disease also occurs with unusual frequency among patients with hairy cell leukemia, which is characterized by monocyte deficiency and dysfunction.
- The definitive method for diagnosis of Legionella infection is isolation of the organism from respiratory secretions or other specimens.
- Multiple selective BCYE media containing dyes are required for maximal sensitivity.
- Colonies grow slowly, requiring 3–5 days to become grossly visible.

286. C- Serratia marcescens

The characteristic property of *Serratia* is production of a red non-diffusible pigment called **prodigiosin,** which is formed optimally at 30'C .

- S. marcescens is the medically most important species.
- Human infection with other species is rare.
- It is a saprophyte found in water, soil and food. It may grow in sputum after collection and makes the sputum red (due to pigment production). This condition is known as 'pseudohemoptysis'.

287. A- Mycoplasma

Colonies can be examined by:

a) Hand lens
b) Dienes' staining: Plate is flooded with alcoholic solution of methylene blue and azure, and examined under low power microscope.

Mycoplasmas retain colour for at least 2 days and appear intense royal blue, whereas Ureaplasmas appear reddish to greenish blue.

288. B- Borrelia recurrentis

- A unique process of DNA rearrangement within vmp genes located on linear plasmids results in extensive variation in the expression of the surface antigens in relapsing fever borreliae.
- These vmp genes encode variable major proteins (VMPs) found on the spirochete's outer-membrane surface.
- The antigenic variation generated by sequential expression of previously silent vmp genes allows the borreliae to intermittently escape the immune response of the host and results in the febrile spirochetemic relapses that are characteristic of infection with these organisms.

289. A- Typhoid fever between 5th to 14th days

290. B- Clostridium perfringens

- A CAMP positive Group B Streptococcus is streaked in the center of sheep blood agar, and Clostridium perfringens is streaked perpendicular to it.
- Following incubation at 37°C for 24-48 hours in anaerobic conditions, the "bow-tie" zone of enhanced hemolysis pointing towards Streptococcus agalactiae is seen.
- This is because of alpha toxin produced by Clostridium perfringens interacts with CAMP factor and produce synergistic hemolysis.

291. C -H antigen

Please see explanation to Q 283.

292. D- Polymyxin, lysozyme, EDTA and Thallous acetate

PLET medium: It consists of polymyxin B, lysozyme, EDTA and thallous *acetate* added in heart infusion agar. It has been devised to isolate *B. anthracis* from mixtures of other spore bearing bacilli.

293. B- Staphylococcus

294. C-III

295. D- Pseudomonas aeruginosa

Please refer to explanation to Q.214.

296. A-Yolk sac inoculation

B-Cell culture using McCoy cell lines

C-Cell culture using HeLa cells

Chlamydiae cannot be cultivated in artificial media. They can grow only in embryonated egg (yolk sac), animal (mice) and cell line.

- Both egg and mice inoculation methods are no longer in use.
- Mice inoculation was used in the past for isolation of C. psittaci and LGV serovars of C. trachomatis. Others are not infective to mice.
- Cell line culture is the traditional method of diagnosis in the past, was considered as the gold standard method. Though highly specific, it is less sensitive (90% compared with NAATs), time consuming, technically demanding and labor intensive.
- Choice of the cell line depends on the species-C. trachomatis recommended cell lines are McCoy, HeLa 229, buffalo, green monkey and baby hamster kidney (BHK-21) cell lines.
- C. pneumoniae can be isolated from HEp2 or human fibroblast cell line.
- C. psittaci although grow well in cell culture, isolation should not be attempted in the routine laboratory because of the risk of laboratory infection.

297. A-More prevalent in developing countries.

B-Toxigenic strains can cause ulcers

D-About 50 % world's population is affected

- Helicobacter pylori, which persistently colonizes the stomachs of ~50% of the world's human population, is the main risk factor for peptic ulceration as well as for gastric adenocarcinoma and gastric MALT (mucosa associated lymphoid tissue) lymphoma.
- Humans are the only important reservoir of H. pylori.

298. B-TPHA on serum sample of newborn

C-VDRL on the paired sample of the infant and mother

299. B- Diagnosis of XDR-TB is always laboratory based.

C-Symptoms of XDR-TB are same as drug susceptible tuberculosis.

D-XDR-TB strains are more common in HIV patients.

300. B-Clinical manifestations are similar 01 EL Tor strains

C-Epidemiologically indistinguishable from 01 El Tor strain

- 139 (Bengal strain): It was isolated first from Chennai in 1992. Since it was not agglutinated by any of the antisera available available at that time (O 1 to O 138), it was designated as a new serogroup O 139 or the Bengal strain as it spread rapidly along the coastal region of Bay of Bengal up to West Bengal, then to the adjacent areas of Bangladesh.
- O139 appears 10 be a derivative of O1 El Tor, but differs from the latter in having a distinct LPS and being **capsulated.**
- As a result, it is invasive and can cause bacteremia and extraintestinal manifestations also.
- There is no cross protection between O1 and O139.
- O139 had caused large-scale outbreaks of clinical cholera and spread rapidly across almost 11 Asian countries and became a threat to cause the next pandemic.
- However, by 1994 the fear had come down and once again the O1 El Tor became dominant and largely replaced 0139.

- Currently, O 139 still causes a minority of cases in India and Bangladesh.

301. A-H. influenzae
B-Streptococcus pneumoniae
D-N. meningitides (group C)

302. B-Ponder's stain
D-Albert stain

- Metachromatic granules: They are present at ends or poles of !he bacilli (also called polar bodies or Babes-Ernst bodies or volulin granules).
- They are storage granules of the organism, composed of polymetaphosphates.
- Granules are stained strongly gram-positive compared to remaining part of the bacilli.
- The granules take up bluish purple metachromatic color when stained with Loeffler's methylene blue.
- However, they are better stained with special
- stains, such as Albert's, Neisser's and Ponder's stain.
- Granules are well developed on enriched media, such as blood agar or Loeffler's serum slope.
- Volutin granules can also be possessed by other organisms such as-by C. xerosi and Gardnerella vaginalis.

303. B-Clostridium botulinum A, B, E and F cause human disease.
C-The gene for botulinum toxin is coded by a bacteriophage.
D-Clostridium baratti may also cause botulinum.

- Toxin types A, B, E, and (rarely) F cause disease in humans.
- In intestinal botulism, toxin is produced in and absorbed from the intestine after the germination of ingested spores.
- Intestinal botulism in infants (infant botulism) is the most common form of botulism.
- Botulinum toxin is also produced by other species such as C. butyricum, C. baratti and C. argentinense.
- BT types C and D are bacteriophage coded.
- Symmetric descending paralysis is characteristic and can lead to respiratory failure and death.
- Cranial nerve involvement, which almost always marks the onset of symptoms, usually produces diplopia, dysarthria, dysphonia, and/or dysphagia.

304. B-Trench fever
D-Q fever
E-Brill-Zinsser disease

305. B-Pathognomonic histological feature
C-Regional lymphadenopathy

- CSD is typically a self-limited illness characterized by regional lymphadenopathy lasting weeks to months.
- The initial clinical manifestation—the primary inoculation lesion—consists of a 0.5- to 1-cm papule, vesicle, or nodule that appears at the site where B. henselae is introduced and persists for ~1–3 weeks.
- Adenopathy typically develops 2–3 weeks after the initial scratch or bite (range, 3–50 days).
- Unilateral solitary or regional lymphadenopathy occurs in more than 90% of patients; its location corresponds with the route of lymphatic drainage.
- Lymph nodes are tender, firm, and mobile, and ~10% suppurate; overlying erythema is occasionally present.
- Nonspecific systemic symptoms, such as fever, anorexia, headache, myalgias, malaise, and abdominal pain, are variably present at this stage.
- Lymphadenopathy usually resolves within 3 months.
- Early in the course of CSD, histologic examination of lymph nodes reveals follicular hyperplasia and arteriolar proliferation.
- Cortical granulomas, with occasional multinucleated giant cells, neutrophilic infiltrates, and coalescing microabscesses (stellate microabscesses), appear within weeks; the granulomas are surrounded by histiocytes and peripheral lymphocytes.

- Warthin-Starry stain may reveal typical clusters of pleomorphic gram-negative organisms within areas of necrosis, blood vessel walls, or erythrocytes.

306. E- Isoniazid, rifampicin, any fluoroquinolone and kanamycin

Extensively drug-resistant Tuberculosis (XDR-TB) :

Definition: They are MDR -TB cases which are also resistant to:

- Fluoroquinolones (ofloxacin /levofloxacin) and
- At least one injectable aminoglycosides (kanamycin, amikacin or capreomycin).

307. D- Directly observed treatment short course

308. A- Clostridium botulinum

- Ingestion of honey containing the organism is implicated in transmission of infant botulism.
- Affected infants develop weakness or paralysis and may need respiratory support but usually recover spontaneously.

309. A- It imparts high-level resistance to vancomycin

D- It acts by synthesis of different peptidoglycan

Vancomycin Resistant Enterococci (VRE)

Vancomycin resistance in enterococci has been increasingly reported now a days.

- Vre is mediated by VAn gene, which alters the target site for vancomycin present in the cell wall i.e. D-anlanyl-D-alanine side chain nof peptidoglycan layer (which is the usual target site for vancomycin), is altered to D-alanyl-D-serine or D-alanyl-D-lactate. This alttered side chains have less affinity for binding to vancomycin.
- **Van gene has 5 genotypes:** van A to Van E.
  - Strains with Van A gene show high level resistance to both glycopeptides vancomycin and teicoplanin.
  - Strains win Van B gene show low level resistance to vancomycin, but sensitive to teicoplanin.
  - E. gallinarum and E. casseliflavus possess Van C genes and they show intrinsic resistance to both tie glycopeptides.

310. C-Coagulase

- There are two coagulase-negative staphylococci of medical importance: S. epidermidis and S. saprophyticus.
- S. epidermidis infections are almost always hospital-acquired, whereas S. saprophyticus infections are almost always community-acquired.
- S. epidermidis is part of the normal human flora on the skin and mucous membranes but can enter the bloodstream (bacteremia) and cause metastatic infections, especially at the site of implants.
- It commonly infects intravenous catheters and prosthetic implants (e.g., prosthetic heart valves [endocarditis], vascular grafts, and prosthetic joints [arthritis or osteomyelitis]).
- S. epidermidis is also a major cause of sepsis in neonates and of peritonitis in patients with renal failure who are undergoing peritoneal dialysis through an indwelling catheter.
- It is the most common bacterium to cause cerebrospinal fluid shunt infections.

311. A- H. pylori

Complete bacterial genome has been identified for H.pylori and Haemophilus influenzae.

312. B- Imipenem

TREATMENT	MRSA

- Vancomycin is the drug of choice for MRSA.
- Alternate drugs include – teicoplanin, linezolid. daptomycin and quinupristin/dalfopristin.
- However, even drugs such as tetracycline, erythromycin or cotrinrwxazole may also be effective in nan life-threatening infections.
- Antimicrobial susceptibility testing is necessary before an alternative drug is used.
- For nasalcarriers of MRSA – mupirocin (2%) ointment.
- All β lactam drug 5 should be avoided. However. 5th generation cephalosporins, such as ceftobiprole and ceftibuten have shown so me activity against MRSA.

313. A- Is coagulase positive

Staphylococci of Medical Importance

Species	Coagulase Production	Typical Hemolysis	Important Features1	Typical Disease
S. aureus	+	β	Protein A on surface	Abscess, food poisoning, toxic shock syndrome
S.epidermidis	–	None	Sensitive to novobiocin	Infection of prosthetic heart valves and hips; common member of skin flora
5. saprophytics	–	None	Resistant to novobiocin	Urinary tract

All staphylococci are catalase-positive.

314. A-Resistance is produced as a result of alteration in penicillin binding protein

- Approximately 20% of S. aureus strains are methicillin-resistant or nafcillin resistant by virtue of altered penicillin-binding proteins.
- These resistant strains of S. aureus are often abbreviated MRSA or NRSA, respectively.
- Such organisms can produce sizable outbreaks of disease, especially in hospitals. The drug of choice for these staphylococci is vancomycin, to which gentamicin is sometimes added.
- Daptomycin is also useful.
- Trimethoprim-sulfamethoxazole or clindamycin can be used to treat non–life-threatening infections caused by these organisms.
- Note that MRSA strains are resistant to almost all β-lactam drugs, including both penicillins and cephalosporins.
- Ceftaroline fosamil is the first β-lactam drug useful for the treatment of MRSA infections.

315. C- Expression of methicillin resistance in Staphylococcus aureus increases when it is incubated at 37°C on blood agar

Detection of MRSA :

- Antimicrobial susceptibility test: Disc diffusion test can be done by using cefoxitin or oxacillin discs. Cefoxitin is die recommended disc to be used. If oxacillin disc is used, then certain conditions are to be maintained such as- using media containing 2-4% NaCl, incubation at 30 °C and full 24 hours incubation.
- Oxacillin screening agar: Adding oxacillin 6 µg/ml and NaCl (2-4%) to the medium.
- PCR detecting mecA gene

316. C- Staphylococcus saprophyticus

- S. saprophyticus causes urinary tract infections, particularly in sexually active young women.
- Most women with this infection have had sexual intercourse within the previous 24 hours.
- This organism is second to Escherichia coli as a cause of community-acquired urinary tract infections in young women.

317. C- Toxin can be destroyed by boiling for 30 minutes

- Food poisoning (gastroenteritis) is caused by ingestion of enterotoxin, which is preformed in foods and hence has a short incubation period (1–8 hours).
- In staphylococcal food poisoning, vomiting is typically more prominent than diarrhea.
- Enterotoxin causes food poisoning characterized by prominent vomiting and watery, nonbloody diarrhea.
- It acts as a superantigen within the gastrointestinal tract to stimulate the release of large amounts of IL-1 and IL-2 from macrophages and helper T cells, respectively.

- The prominent vomiting appears to be caused by cytokines released from the lymphoid cells, which stimulate the enteric nervous system to activate the vomiting center in the brain.
- Enterotoxin is fairly heat-resistant and is therefore usually not inactivated by brief cooking.
- It is resistant to stomach acid and to enzymes in the stomach and jejunum.
- There are six immunologic types of enterotoxin, types A–F.

318. B- Staph epidermidis

Please refer to explanation to question 313.

319. B- Vagal stimulation

Please refer to explanation to question 317.

320. D- Staphylococcus aureus

Please refer to explanation to question 317.

321. A- S. aureus

Please refer to explanation to question 317.

322. C-γ toxin

E-Panton valentine toxin

- Synergohymenotropic toxins: γ-hemolysin and PV toxin are called as synergohymenotropic toxins.
- Because they are not active individually, but in combination they are capable of producing hemolytic and leukocidal activity.
- There are six combinations possible by the interaction between three fragments of gamma hemolysin with the two fragments of PV toxin.
- PV toxin is expressed on MRSA (methicillin-resistant Staphylococcus aureus) strains, which are associated with the community acquired infections.

323. A- Staphylococcus aureus

Skin and soft tissue infections

S. aureus is one of the most common cause of various skin and soft tissue Infections such as:

- **Folliculitis** (Infection of hair follicies)
- **Furuncie (boil):** Painful pustular lesion in moist regions due to Infection of the hair follicle
- **Carbuncle:** Severe, painful lesion in the lower neck region, extending to the deeper subcutaneous tissue
- Mastitis and breast abscess (in nursing mothers)
- **Impetigo:** It mainly occurs in children, usually appears as red sores on the face, that bursts and develops into **honey-colored crusts**
- Surgical site wound infections
- Cellulitis (inflammation of skin and subcutaneous tissue)
- **Hidradenitis suppurativa:** A recurrent follicular infection in areas rich in a apocrine glands, such as the axilia
- **Botryomyeosis:** It is mycetoma-like condition, characterized by subcutaneous smelling, sinuses, and discharge containing granules

Predisposing factors to S. aureus cutaneous infections are – chronic skin conditions (e.g. eczema), skin damage (trauma, injectors) or poor personal hygiene.

Musculoskeletal infections

S. aureus is the most common cause of various conditions such as:

- Septic arthritis (most commonly involved Joints.are knees, shoulders, hips, and phalanges)
- Osteomyelitis (most commonly affected site in children is long bones and in adults is vertebrae)
- **Pyomyoslitis (skeletal muscle infection):** In tiopics and HIV infected people
- **Abscess:** Psoas abscess and epidural abscess

Respiratory tract infections

- Ventilator associated pneumonia in adults
- Septic pulmonary emboli
- Post viral pneumonia (e.g. influenza)
- Empyema and Pneumothora*
- Pneumatocele (shaggy, thin-walled cavities in lungs) in neonates: S. aureus is the most common cause

Bacteremia and its complications

- Sepsis, septic shock
- Central line associated blood stream infection
- Metastatic foci of infection involving kidney, joints, bone and lung
- Infective endocarditis:
  - Native-valve endocarditis – S. aureus is the most common cause
  - Prosthetic -valve endocarditis
  - Intravenous drug use associated endocarditis– S. aureus is the most common cause

UTI (Urinary tract infection)

- Staphylococcal UTI and pyelonephritis usually occur secondary to bacteremia.
- Rarely UTI is seen following instrumentation and insertion of catheter or Implants.

Toxin-mediated illnesses (Described earlier)

S. aureus causes the following town mediated diseases (as described earlier):

- Toxic shoek syndrome
- Food poisoning
- Staphylococcal scalded-skin syndrome

Infections associated with CA-MRSA (Community associated methiullin-resistant Staphylococcus aureus)

While skin and soft tissues are the most common sites for CA-MRSA strains; 5-10% of strains are invasive and can cause various invasive infections, such as:

- Necrotizing pneumonia
- Sepsis with Waterhouse-Friderichsen syndrome or purpura fiiminans (S. aureus Is rare cause: most commonly caused by meningococcus)
- Necrotizing fascii tis (5. aureus is a ra re cause, Streptococcus pyogenes is the most com men cause)

324. A- Staphylococcal food poisoning

325. C- Furuncle
D-Impetigo contagiosa
E-Sycosis barbae

Please refer to explanation to question 323.

326. A- Staphylococcus aureus

Please refer to explanation to question 323.

327. A- Most common source of infection is cross infection from infected people

- S. aureus is a part of the normal human flora; ~25–50% of healthy persons may be persistently or transiently colonized.
- The rate of colonization is higher among insulin-dependent diabetics, HIV-infected patients, patients undergoing hemodialysis, and individuals with skin damage.
- The anterior nares are a frequent site of human colonization, although the skin (especially when damaged), vagina, axilla, perineum, and oropharynx may also be colonized.

- These colonization sites serve as a reservoir of strains for future infections, and persons colonized with S. aureus are at greater risk of subsequent infection than are noncolonized individuals.

328. B- Staphylococcus aureus

Please refer to explanation to question 323.

329. B- Anti-teichoic acid

- Teichoic acids are polymers of ribitol phosphate.
- They mediate adherence of the staphylococci to mucosal cells.
- Lipoteichoic acids play a role in the induction of septic shock by inducing cytokines such as interleukin-1 (IL-1) and tumor necrosis factor (TNF) from macrophages.

330. B- mecA gene

- The isolation of MRSA was reported within 1 year of the introduction of methicillin.
- The prevalence of MRSA has since increased steadily.
- In many hospitals, 40–50% of S. aureus isolates are now resistant to methicillin. Resistance to methicillin indicates resistance to all SPRPs as well as to all cephalosporins.
- Production of a novel penicillin-binding protein (PBP 2a or 2′) is responsible for methicillin resistance.
- This protein is synthesized by the mecA gene, which (as stated earlier) is part of a large mobile genetic element—a pathogenicity or genomic island—called SCCmec.
- It is hypothesized that this genetic material was acquired via horizontal transfer from a related staphylococcal species, such as S. sciuri

331. C- TSS

Toxic shock syndrome is characterized by fever; hypotension; a diffuse, macular, sunburn-like rash that goes on to desquamate; and involvement of three or more of the following organs: liver, kidney, gastrointestinal tract, central nervous system, muscle, or blood.

332. A- S.aureus

Please refer to explanation to question 323.

333. B- Enterotoxin B
C- Enterotoxin C
E- Enterotoxin F

334. D- None

- Staphylococci may be introduced into tissue as a result of minor abrasions, administration of medications such as insulin, or establishment of IV access with catheters.
- After their introduction into a tissue site, bacteria replicate and colonize the host tissue surface.
- A family of structurally related S. aureus surface proteins referred to as MSCRAMMs (microbial surface components recognizing adhesive matrix molecules) plays an important role in mediating adherence to these sites.
- By adhering to exposed matrix molecules (e.g., fibrinogen, fibronectin), MSCRAMMs such as clumping factor and collagen-binding protein enable the bacteria to colonize different tissue surfaces; these proteins contribute to the pathogenesis of invasive infections such as endocarditis and arthritis by facilitating the adherence of S. aureus to surfaces with exposed fibrinogen or collagen.

335. A- Staphylococcus aureus

336. B- Beta lysin

Hemolysins of Staphylococcus aureus and their activity

Hemolysins	Activities
α-hemolysins	It is inactivated at 70°C but again reactivated paradoxically at 100°C (This is beacuse at 60°C α-hemolysin combines with a heat labile inactivator which gets denatured at 100°C). • It possesses lethal, leukocidal, dermomercrotic, cytotoxic and neurotoxic activities. • It lyses rabbit RBCs, but is less active against sheep and human RBCs.

β-hemolysins	It is sphingomyelinase in nature: • Lyses sheep RBC, but not human or rabbit RBC. • Exhibits hot-cold phenomenon, i.e. hemolysis starts at 37°C but becomes evident only after chilling.
γ-hemolysins	• It has three protein fragments which act together along wtlh leukocidin to exhibit hemolytic activity. • It lyses rabbit sheep and human RBCs.
δ-hemolysins	• It lias detergent like (surfactant) action. • It lyses rabbit, sheep, horse and human RBCs. • It is also lethal, leukocidal and dermonecrotic.

337. B- Catalase test

Catalase test is the most important test to differentiate Staphylococcus(catalase positive) and Streptococcus (catalase negative).

338. B- Coagulase negative staphylococcus

Please refer to explanation to question 310.

339. C- Coagulase negative staphylococcus

340. B- Staphylococcus aureus

- S. aureus is among the most common causes of foodborne outbreaks of infection in the West.
- Staphylococcal food poisoning results from the inoculation of toxin-producing S. aureus into food by colonized food handlers.
- Anterior nares are the most common site of carriage of S,aureus, so nose picking is a way to contaminate food.

341. C- Clostridium

342. A- Staphylococcus epidermidis

- Prosthetic valve endocarditis (PVE) arising within 2 months of valve surgery is generally nosocomial, the result of intraoperative contamination of the prosthesis or a bacteremic postoperative complication.
- This nosocomial origin is reflected in the primary microbial causes: S. aureus, CoNS, facultative gram-negative bacilli, diphtheroids, and fungi.
- The portals of entry and organisms causing cases beginning >12 months after surgery are similar to those in community-acquired NVE.
- PVE due to CoNS that presents 2–12 months after surgery often represents delayed-onset nosocomial infection.
- Regardless of the time of onset after surgery, at least 68–85% of CoNS strains that cause PVE are resistant to methicillin.

343. A- Bacitracin sensitivity

Bacitracin test is used to differentiate Streptococcus pyogenes(Group A) from other beta hemolytic Streptococci.

344. B- In acute glomerulonephritis, the titer is low

345. A- Streptococcus pyogenes

Streptococcus pyogenes is the most common cause of cellulitis.

346. B- Enterococcus fecalis

- Enterococci give a positive bile aesculin hydrolysis lest (they grow in the presence of 40% bile and hydrolyse aesculin to aesculetin chat combines with ferric chloride to produce black colored complex).
- They can grow in presence of extremes of conditions such as- 6.5% NaCl, 40% bile, pH 9.6, 45°C and 10°C.

347. C- Optochin

- It is a typical case of pneumococcal pneumonia.
- Optochin sensitivity: Pneumococci are sensitive to optochin disk (5 µg of ethyl hydrocuprein) and produce wider zone of inhibition (14 mm or more).

- Viridans streptococci are resistant to optochin.

348. C- Pneumococcus

- After 18 hours of incubation, colonies on blood agar are small (0.5-1 mm), dome shaped, glistening surrounded by green discoloration due to alpha hemolysis.
- On further incubation, colonies become flat with raised edge and central depression or umbonation due to autolysis of centre of the colonies by autolysin enzyme.
- Colonies appear as concentric rings when viewed from above (draughtsman shaped or carom coin appearance).

349. C- S. mutans

- Dental caries: It is mainly caused by S mutans which breaks down dietary sucrose to acid and dextran.
- Acid damages the dentine, while adhesive dextran binds together with food debris, mucus, epithelial cells and bacteria to produce dental plaques.

350. A- Capsular swelling

- Quellung reaction: Capsular serotypes of Streptococcus pneumoniae can be detected by adding antisera mixed with methylene blue.
- Capsule becomes swollen, refractile and delineated.

351. A- Pneumococcus

- The risk of serious pneumococcal infection is greatly increased in persons with conditions that compromise IgG synthesis and/or the phagocytic function of PMNs and macrophages.
- Most patients hospitalized for pneumococcal pneumonia have one or more of these conditions.

Conditions that Commonly Predispose to Pneumococcal Infection

Increased risk of exposure: • Day-care centers • Military training camps • Prisons • Shelters for the homeless Respiratory infection, inflammation: • Influenza, other viral respiratory infections • Air pollution • Allergies • Cigarette smoking • Chronic obstructive pulmonary disease • Other causes of chronic pulmonary inflammation or obstruction Anatomical disruption of meninges (dural tear) Defective antibody formation: • Common variable hypogammaglobulinemia • Selective IgG subclass deficiency • Multiple myeloma • Chronic lymphocytic leukemia • Lymphoma	Defective complement function: • Defective bacterial clearance[a] • Congenital asplenia, hypospllenia • Splenectomy • Sickle cell disease • Multifactorial conditions: Infancy and aging • Chronic disease • Prior hospitalization • Alcoholism • Malnutrition • HIV infection • Chronic lung disease • Glucocorticoid treatment • Cirrhosis of the liver • Renal insufficiency • Diabetes mellitus • Anemia • Coronary artery disease Fatigue, stress, and/or exposure to cold

- Once a pneumococcal infection has been initiated, the absence of a spleen predisposes to fulminant disease.
- The liver can remove opsonized (antibody-coated) pneumococci from the circulation; in the absence of antibody, however, only the slow passage of blood through the splenic sinuses and prolonged contact with reticuloendothelial cells in the cords of Billroth can result in bacterial clearance.
- Patients without spleens tend to develop overwhelming pneumococcal disease that rapidly progresses to death.

352. B -Maltose fermentation

Neisseriae of Medical Importance[1]

Species	Portal of Entry	Polysaccharide Capsule	Maltose Fermentation	β-Lactamase Production	Available Vaccine
N. meningitidis (meningococcus)	Respiratory tract	+	+	None	+
N. ganorrhoeae (gonococcus)	Genital tract	-	-	Some	-

[1] All neisseriae are oxidase-positive

353. B- Deficiency of late complements

- Complement is required for bactericidal activity and for efficient opsonophagocytosis.
- Individuals deficient in any of the late complement components (C5–C9) cannot assemble the membrane-attack complex (MAC) needed to kill Neisseria.

354. B- Possess a capsule

Please refer to explanation to question 352.

355. B- N. meningitidis

- The most severe form of meningococcaemia is the life-threatening Waterhouse–Friderichsen syndrome, which is characterized by high fever, shock, widespread purpura, disseminated intravascular coagulation,
- thrombocytopenia, and adrenal insufficiency.
- Bacteremia can result in the seeding of many organs, especially the meninges.
- The symptoms of meningococcal meningitis are those of a typical bacterial meningitis, namely, fever, headache, stiff neck, and an increased level of PMNs in spinal fluid.

356. B- C. perfringens

Necrotizing enteritis (enteritis necroticans or pigbel) is caused by beta toxin produced by type C strains of C. perfringens after ingestion of a high-protein meal in conjunction with trypsin inhibitors (e.g., in sweet potatoes) by a susceptible host who has limited intestinal proteolytic activity.

357. D- C. sporogenes

Some 80% of cases are caused by C. perfringens, whereas C. novyi,C. septicum, and C. histolyticum cause most of the remaining cases of gas gangrene.

358. D- Tetanus toxoid

359. B- Clostridium difficile

- Clostridium difficile–associated disease (CDAD) is a unique colon infection that is acquired almost exclusively in association with antimicrobial use and the consequent disruption of the normal colonic flora.
- The most commonly diagnosed diarrheal illness acquired in the hospital,CDAD results from the ingestion of spores of C. difficile that vegetate, multiply, and secrete toxins, causing diarrhoea and pseudomembranous colitis (PMC).
- Risk factors for CDAD include older age, greater severity of underlying illness, gastrointestinal surgery, use of electronic rectal thermometers, enteral tube feeding, and antacid treatment.
- Use of proton pump inhibitors may be a risk factor.

360. A-Clostridium sordelli
B- Clostridium sporogenes
E- Clostridium botulinum

361. A- Acute oesophagitis

362. D- C2

Of the eight distinct toxin types described (A, B, C1, C2, D, E, F, and G), all

except C2 are neurotoxins; C2 is a cytotoxin of unknown clinical significance.

363. D- Type 6

364. A- C. tertium

- C. tetani-produces spherical and terminal spore (drumstick appearance).
- C. tertium-produces oval and terminal spore (tennis racket appearance).
- C. bifermentans-produces central and oval spore.

365. A- C. perfringens

C. perfringens and C. tetani type 6 are non-motile Clostridia.

366. A- Clostridium perfringens

Some 80% of cases are caused by C. perfringens, whereas C. novyi,C. septicum, and C. histolyticum cause most of the remaining cases of gas gangrene.

367. B- Diarrhea

Food-Borne Botulism:

- After ingestion of food containing toxin, illness varies from a mild condition for which no medical advice is sought to very severe disease that can result in death within 24 h.
- The incubation period is usually 18–36 h but, depending on toxin dose, can range from a few hours to several days.
- Symmetric descending paralysis is characteristic and can lead to respiratory failure and death.
- Cranial nerve involvement, which almost always marks the onset of symptoms, usually produces diplopia, dysarthria, dysphonia, and/or dysphagia.
- Weakness progresses, often rapidly, from the head to involve the neck, arms, thorax, and legs; occasionally, weakness is asymmetric.
- Nausea, vomiting, and abdominal pain may precede or follow the onset of paralysis.
- Dizziness, blurred vision, dry mouth, and very dry, occasionally sore throat are common.
- Patients are generally alert and oriented, but they may be drowsy, agitated, and anxious.
- Typically, they have no fever.
- Ptosis is frequent; the pupillary reflexes may be depressed, and fixed or dilated pupils are noted in half of patients.
- The gag reflex may be suppressed, and deep tendon reflexes may be normal or decreased. Sensory findings are usually absent.
- Paralytic ileus, severe constipation, and urinary retention are common.

368. A. Clostridium perfringens

- Smears of C. perfringens shows large gram-positive rods typically look like Box car appearance.

369. B. Plasmid

- Tetanospasmin is a neurotoxin which is plasmid mediated.
- It prevents the release of inhibitory neurotransmitter GABA and glycine in pre synaptic area which leads tospastic muscle contraction.

370. B. C. perfringens

- Nagler reaction is a useful test for rapid detection of C. perfringens in clinical specimens
- This reaction demonstrates biological property of the enzyme lecithinase—to produce opalescence in the serumand in the egg yolk media.
- This reaction is specifically neutralized by the use of specific antitoxin.

371. A. Inhibition of GABA release

Refer Q. no 369.

372. D. Antibiotic use

- Antibiotics suppress drug-sensitive members of the normal flora, allowing C.difficile to multiply and produce exotoxins A and B.
- Both exotoxin A and exotoxin B are glucosyltransferases
- The main effect of exotoxin B in particular is to cause depolymerization

of actin, resulting in a loss of cytoskeletal integrity, apoptosis, and death of the enterocytes.

- Clindamycin and 3rd gen cephalosprins are commonly involved drugs.

373. C. Susceptible to diphtheria

- Susceptible individuals develops erythema and induration on test arm followingintradermal inoculation of toxin.
- Vaccination is needed only to these susceptible population.

374. D. Corynebacterium

- Ehrlich phenomenon - the difference between the amount of diphtheria toxin that will exactly neutralize one unit of antitoxin.

375. C. Diphtheria

- Diphtheria – leather
- Anthrax - Coal

376. A. Cause cranial nerve palsies in 2nd and 3rd week

- Gram positive bacilli.
- Passive immunization is life saving management in respiratory diphtheria.
- Best treatment is anti toxin.

377. A. Ponder's stain

- Metachromatic granules are best stained by Albert, Ponder and Neisser stain.

378. A. Elek's gel ppt test

- It is an in vitro neutralizationreaction between toxin and antitoxin.
- The toxin produced by the growth of the test strain diffuses into the agar and meets the antitoxin at the optimalconcentration, and the line of precipitation can be seen.
- In strains that are negative, no precipitin lines are seen.

379. A. Throat swab culture

- Carriers and early stage of cases are best diagnosed by throat swab culture.

380. C. Cysteine-tellurite agar

- Tellurite medium is very useful for isolation of C. diphtheriae from contacts, carriers, and convalescents, in which clinicalspecimens contain a number of other bacteria.
- The bacteria on tellurite medium produce characteristic black to grayish black colored colonies after 48 hours of incubation

381. C. Klebs-Löffler bacillus

- Koch bacillus – M.tuberculosis
- Yersin& Roux – Diphtheria toxin

382. A. Corynebacterium minutissimum

- Erythrasma is a bacterial infection that affects the skin.
- It usually appears in the folds of the skin. It's more commonly seen in warm or humid climates, and is usually caused by the bacteria Corynebacterium minutissimum.

383. A. Susceptibility to diphtheria

- The Schick test, invented between 1910 and 1911, is a test used to determine whether or not a person is susceptible to diphtheria.
- It was named after its inventor, Béla Schick.

384. B. Presence of abdominal pain

- The symptoms consist of acute abdominal pain, diarrhea, and nausea; vomiting is rare.
- The disease generally lasts for 24 hours or more. The fecal samples contain small numbers of B. cereus.
- Diarrheal form of food poisoning is caused by B. cereus serotypes 2, 6, 8, 9, 10, or 12

385. B. B. cereus

- It produces secreted and a pre formed toxin which are non invasive.

386. A. B. anthracis

- The typical lesion of cutaneous anthrax is a painless ulcer with a black eschar (crust,scab).
- Local edema is striking. The lesion is called a malignantpustule.

- Untreated cases progress to bacteremia and death

387. A. Cutaneous anthrax

- Refer Q. no 386.

388. D. Brain abscess

- N. asteroides typically causes either pneumonia, lung abscess with cavity formation,lung nodules, or empyema. From the lung, the organism can spread to various organs, notablythe brain, where it causes brain abscess.
- Disease occurs most often inimmunocompromised individuals, especially those with reduced cell-mediatedimmunity.

389. A. Paraffin bait technique

- Paraffin baiting is a routine laboratory diagnostic procedure for the isolation of Nocardia asteroids.

390. A. Can erode bones&d.Slow growing

- Madura foot is a chronic infection of the skin and underlying tissues caused by both bacteria (actinomycotic mycetoma or actinomycetomas) and fungi (eumycetomas or mycotic mycetoma).
- Mycetoma occurs most often in people who work in rural areas, usually in farmers, hunter-gatherer populations, and field labourer.

391. A. Anthrax

- Pulmonary (inhalation) anthrax, also known as "wool-sorter's disease," begins with nonspecific respiratory tract symptoms resembling influenza, especially a drycough and substernal pressure.
- This rapidly progresses to hemorrhagic mediastinitis, bloody pleural effusions, septic shock, and death

392. A. Bacillus anthracis

- On nutrient agar after 24 hours of incubation, B. anthracis produces grayish and granular colonies measuring2–3 mm in diameter.
- Under low-power microscopy, the edges of the colony appear as long, interlacing chains of bacilli, resembling locks of matted hair, which gives them a "medusahead" appearance with an uneven surface and wavy margin

393. D. Mycetoma

- Mycetoma is characterized by a triad of painless subcutaneous mass, multiple sinuses and discharge containing grains.
- It usually spreads to involve the skin, deep structures and bone resulting in destruction, deformity and loss of function, which may be be fatal.
- Mycetoma commonly involves the extremities, back and gluteal region.

394. B. Actinomadura madure

- Most common cause in India is A. madurae followed by M.mycetomatis and Nocardia brasiliensis.

395. A. Cervicofacial

- The typical lesion of actinomycosis appears as a hard, nontender swelling thatdevelops slowly and eventually drains pus through sinus tracts.
- Hard, yellow granules (sulfur granules) composed of a mass of filaments are formed in pus.
- In about 50% of cases, the initial lesion involves the face and neck (Cervicofacial type).

396. A. Listeria monocytogenes

- Among the choices, the only Gram positive bacilli is Listeria monocytogenes.
- It is associated with meningitis (Usually neonatal meningitis)

397. A. Listeria monocytognes

- Listeria must then navigate to the cell's periphery to spread the infection to other cells.
- Outside the body, Listeria has flagellar-driven motility, sometimes described as a "tumbling motility".

398. B. Withhold breastfeeding

- The mother and infant should stay together

- The infant should be breastfed in the normal way.
- If the mother is sputum smear positive just before delivery: give the mother anti-tuberculosis treatmentand advise her to continue breastfeeding; give the infant preventive chemotherapy with isoniazid for 6 months.

399. C. LJ media & B. Dorset media

- NNN medium – Leishmania
- Nutrient agar – Basal medium
- Egg Based medium for MTB- Lowenstein Jensen, Petragnani, Dorset, Blood Based Media – Tarshis

400. A. Uterus

- Although Leprosy rarely involves the female genital tract, the ovary is the most commonly involved gynaecological site

401. C. Cyclosporine

- Cyclosporine is used to prevent organ rejection in people who have received a liver, kidney, or heart transplant.
- It is usually taken along with other medications to allow your new organ to function normally.
- Cyclosporine belongs to a class of drugs known as immunosuppressants.
- Drugs used for Lepra reaction II are thalidomide, glucocorticoid, clofazimine & antipyretics

402. B. Cell mediated

- Tuberculin test is based on type IV HSR
- Applications are
- It is used for evaluation of cases that have tuberculosis and for diagnosis of cases suspected to be infected withM. tuberculosis.
- It is used to diagnose active tuberculosis infection in infantsand young children.
- It is also used to select population susceptible for BCG(bacille Calmette–Guerin) vaccination.
- It is a valuable test to measure prevalence of tuberculosisinfection in a community.

403. B. 5%

- M.tuberculosis – 20 %, asper RNTCP -25%
- Nocardia – 1% & 0.5% (fluids)
- Bacterial spore – 0.25%

404. B. Amidase test

- Atypical mycobacteria are positive for Amidase test and Aryl sulfatase test.

405. A. Contraindicated

- BCG vaccine is contraindicated in people with impaired immunity, and WHO does not recommend BCG vaccination for children with symptomatic HIV infection.

406. B. Armadillos

- Nine banded Armadillo is highly susceptible to leprosy, due to low body temperature.
- Next is foot pad of mice.
- Other animal models are Korean chipmunk, Indian pangolin, Slender loris and European hedgehog.

407. C. Sputum culture

- Sputum culture is the gold standard method for the diagnosis for pulmonary tuberculosis.
- Sputum microscopy is a screening test with low sensitivity and high specificity.

408. D. Mutation

Mutation in the following genes leads to resistance to the respective drugs.

- KatG, Inh A, ampC - Isoniazid
- rpoB - Rifampicin
- Pnc A - Pyrazinamide
- emb A, B, C – Ethambutol
- rpSL - Streptomycin

409. A. Armadillos

Refer Q. no 406

410. D. M. smegmatis

- This organism is classified as saprophytic and therefore relatively safe.

- Mycobacterium smegmatis doesn't normally reside in any animals, and doesn't cause dangerous or even any infections.
- There have only been a few threats, which have seem to come out in only extreme cases, however there hasn't been any documented virulence of Mycobacterium smegmatis in over 15 years.

411. C. M. ulcerens

- Buruli ulcer, caused by Mycobacterium ulcerans is a chronic debilitating disease that affects mainly affects the skin and sometime bone

412. C. Poncet's disease

- Tubercular rheumatism (Poncet's Disease) is a non-destructive para-infective symmetric polyarthritis occurring in patients with active visceral or disseminated tuberculosis, in which there is neither evidence of bacteriological involvement of joint themselves nor any other known cause of polyarthritis detected.

413. A. Lepromatous leprosy

- Lepra type II reactions are type III humoral hypersensitivity reactions with systemic inflammatory response due to deposition of immune complexes.
- This condition occurs in 20% of patients with lepromatousleprosy and in 10% of patients with borderline leprosy.
- Thisreaction occurs after a few years of therapy and relapse intermittently over several years.
- Appearance of crops of painful erythematous nodules on the skin and subcutaneous tissue is the characteristic manifestation. Fever, malaise, arthralgia, neuralgia, iridocyclitis, arthritis, and proteinuria are other symptoms

414. A. Enteroaggregative E. coli is not associated with persistent diarrhea

- EAEC strains are so called because they show a typical "stacked brick" arrangement on Hep-2 cells orglass due to their autoagglutination.
- EAEC increases mucus secretion, which forms a layer overlying the epitheliumof the small intestine.
- These strains are associated with persistent,watery diarrhea with dehydration in infants, especially in developing countries

415. A. Sereny test is positive

- Sereny test is positive for EIEC.

416. D. Lectin

- Escherichia coli is able to adhere to epithelial cells of the gastrointestinal tract because lectins on the E. coli surface recognize oligosaccharide units on the surfaces of target cells.
- These lectins are located on slender hairlike appendages called fimbriae (pili).

417. A. VI agglutination test

- Salmonella typhi carriers are detected by Stool and urine culture and detection of antibodies to Vi antigen in serum.

418. C. Monovalent vaccine

- Monovalent typhoid vaccines: Vi polysaccharide is a well-standardized antigen that is effective in a single parenteral dose, is safer than whole-cell vaccine, and may be used in children 2 years of age or older

419. C. Caused by animal products & D.Symptoms appear between 4-48 hours

- It's a zoonotic disease and incubation period is few hours to 72 hours.
- Main diagnosis is culture.

420. A. Can be given in patients with yellow fever and hepatitis B

- It is composed of Vi capsular polysaccharide antigen derived from S.Typhi strain Ty2.
- Less side effects than parenteral TAB vaccine
- Protection period is 2 years.

421. A. Pseudomonas & C. V. cholerae

- V. cholerae belongs to family Vibrionaceae

- Pseudomonas belongs to family Pseudomonadaceae

422. A. H. pylori

- Most potent urease producer than any other organism is H. pylori

423. B. Salmonella typhi

- Multidrug-resistant Salmonella enterica serotype Typhimurium definitive phage type 104 (DT 104) has emerged during the last decade as a global health problem because of its association with animal and human disease.

424. A. All are oxidase negative

- All Enterobacteriacae are oxidase negative and catalase positive
- Ferments glucose
- Usually motile by peritrichous flagella

425. B. Typhoid

- The motile bacterium Salmonella typhi, which is known to infect onlyhumans, is spread by ingestion of food, drink or other materialcontaminated by this organism.
- About 2 weeks after infection with Salmonella typhi, most people suffering from typhoid develop a yellow-green foul liquid stool that resembles pea soup in appearance – pea soup stool.

426. A. 0157:H7

- HUS and Haemorrhagic colitis caused by EHEC serotype O157 : H7

427. A. 10-14 days

- The incubation period for typhoid fever is usually 8–14 days,

428. A. Salmonella

- The most common sources of salmonellae are milk and milk products, meat, poultry, and eggs.
- Of great concern are eggs and egg products. Salmonellae can enter through the shell if eggs are left on contaminated chicken feed or feces andgrow inside.

429. C. S.Gallinarum

- Salmonella are motile with the presence of peritrichous flagella except Salmonella Gallinarum and Salmonella Pullorumwhich are nonmotile.

430. A. Shigella sonnei

- All shigella species are non lactose fermenters except S. sonnei which is late lactose fermenter.

431. D. Mannitol

- Shigella ferments mannitol, forming acid but no gas. Mannitol fermentation test is an important biochemical test, which is used to classify shigellae into mannitol-fermenting and -nonfermenting species. S. flexneri, S. boydii, and S. sonnei aremannitol-fermenting species, while S. dysenteriae is mannitolnonfermenting species.

432. D. Shigella dysenteriae

- Shigella dysenteriae causes bacillary dysentery.
- It is an acute gastrointestinal illness manifested by fever, vomiting,abdominal cramps, and tenesmus.
- Incubation period is usually short. It lasts from 12 hours to 7 days, usually 48 hours, and is inversely related to the load of ingestedbacilli.
- The condition manifests with a sudden onset of high-grade fever along with abdominal cramp, tenesmus, urgency, andpassage of loose, scanty feces containing frank blood and mucus.

433. A. Increasing cAMP

- The Heat labile toxin consists of one A subunit and five identical B subunits.
- The B subunits bind to the GM1 gangliosides and facilitates entry of subunit A into the cell by endocytosis.
- The A subunit has ADP (adenosine diphosphate)- ribosyl transferase activity, this results in an increase in cyclic adenosine monophosphate (cAMP) levels leading to an increased

secretion of chloride and a decreased absorption of sodium and chloride.

- This ends in watery diarrhea due tohypersecretion of fluid into the lumen of the gut.

434. B. Heat stable E. coli toxin

- Heat stable E. coli toxin is mediated by cGMP

435. C. MacConkey's medium

- E. coli is lactose fermenter.
- MacConkey agar has Neutral red as an indicator.
- It produces pink color colonies due to lactose fermentation and acidic pH.

436. C. ETEC

- Diarrhea caused by ETEC is endemicin the developing countries, among all age groups of the population.
- This is also responsible for causing traveler's diarrhea in which individuals from developed countries visitingendemic areas often suffer from ETEC diarrhea.
- It causes diarrhea because of its ability to produce heat-labile enterotoxins (LT-I, LT-II). LT-I, which is structurally similar to choleratoxin, produces cholera-like diarrhea in patients.

437. C. P- pili present in uropathogenic type

- ETEC is non invasive
- EPEC–Attachment/Effacement lesions
- ETEC causes travellers diarrhoea

438. B. EHEC

439. A. Pseudo lymphadenopathy

440. B. Agglutination

- Widal test is tube agglutination test for the detection of O and H anibodies.
- Diagnostic test for enteric fever

441. B. Buffered glycerol saline medium

- Buffered Glycerol Saline Base with added glycerol is used in the collection and transportation of faecal specimens.

442. C. Produces 01 lipopolysaccharide

- V. Cholerae O139 possesses serogroup O139 LPS

443. A. ADP ribosylation of G regulatory protein

- Cholera toxin causes ADP ribosylation of G protein which upregulates the activity of adenylate cyclase results in the intracellular accumulation of cyclic AMP.
- Increase in cyclic AMP leads to Accumulation of sodium chloride and water resultingin watery diarrhea. Loss of fluid and electrolytes leads to dehydration and shock.

444. A. cAMP

- Refer Q. No 443

445. b. TCBS medium

- TCBS medium (pH 8.6): This medium contains thiosulfate,citrate, bile salts, sucrose, and bromothymol blue (indicator).
- V. cholerae produces large, yellow convex colonies onthis medium

446. C. Vibrio vulnificus

- V. vulnificus is also a marine organism (i.e., it is found in warm salt waters such asthe Caribbean Sea).
- It causes severe skin and soft tissue infections (cellulitis), especially in shellfish handlers, who often sustain skin wounds. It can also cause a rapidly fatal septicemia in immunocompromised people who have eaten rawshellfish containing the organism.
- Hemorrhagic bullae in the skin often occur in patients with sepsis caused by V. vulnificus. Chronic liver disease (e.g., cirrhosis)predisposes to severe infections.
- The recommended treatment is doxycycline

447. B. 0:139

- In 1992, O139 serogroup was identified in Chennai and the strain was named as Bengal strain.

448. **B. Cholera**

- Incubation period for
- Cholera – few hours to 5 days
- Plague – 2- 6 days
- Typhoid – 8 – 14 days
- Measles – 10 – 12days

449. **A. Can tolerate wide range of alkaline pH**

- It grows well in alkaline pH (8.4 -8.6)
- Non halophile
- Darting motility
- Selective medium is TCBS medium

450. **B. Cary Blair medium**

- V-R medium and Cary Blair medium are the transport media for V. cholerae.
- MYPA medium – B. cereus
- LJ medium – M.tuberculosis
- Stuart medium – transport medium for Gonococci

451. **A. Gram negative rod & D. It is achlorhydria which renders an individual susceptible to disease.**

- The pathogenesis of cholera is dependent on colonization of the small intestine bythe organism and secretion of enterotoxin.
- For colonization to occur, large numbers of bacteria must be ingested because the organism is particularly sensitive tostomach acid.
- Persons with little or no stomach acid, such as those taking antacids orthose who have had gastrectomy, are much more susceptible

452. **A. It is caused by Burkholderia mallei**

- B. pseudomallei is also known as Whitmore's bacillus, is the causative agentof melioidosis in rodents.
- B. pseudomallei was first described by Whitmore and Krishnaswamy
- Selective medium is Ashdown medium

453. **B. Melioidosis**

- Melioidosis is characterized by development of anodule at the site of inoculation of the bacteria in the skin.
- The bacteria can subsequently spread, causing secondary lymphangitis, regional lymphangitis, fever, and myalgia.
- Acute melioidosis may progress rapidly to acute septicemia with highmortality rate.
- Acute blood stream infection is most commonlyseen in patients with HIV, diabetes, renal failure, etc. The condition results in septic shock.

454. **B. Gram -ve, D. Non-motile & E. It is coccobacilli**

- Y. pestis is a Gram-negative coccobacillus
- It is a nonmotile, nonsporing, and non–acid fast.

455. **C. Wayson's stain**

- It is a case of bubonic plague which is caused by Y. pestis.
- Wayson stain is used for the demonstration of the typical bipolar (safety pin) morphology of Y. pestis.

456. **C. Pseudomonas**

- Blue pus is the characteristic feature of Pseudomonas aeruginosa infections due to pyocyanin pigment production.

457. **D. Bacteria**

- In humans, B. mallei may cause acute or chronic infectionwith that localized to the skin, subcutaneous tissue, or respiratory tract.
- Human cases of glanders are usually rare. Commonly seen in horses.

458. **B. Pseudomonas**

- P. aeruginosa produces different types of pigments
- 1.pyocyanin, 2.pyoverdin, 3.pyorubin, and 4.pyomelanin

459. **C. inhibition of Protein synthesis**

- Pseudomonas toxin is Exotoxin A
- It acts on EF2 and preventing synthesis of proteins ineukaryotic cells

460. C. Kerala

In India, outbreaks are reported Kolar, Surat, Beed-Latur belt in Maharashta, Rohru in Himachal Pradesh, Dangud (Uttar kasha) in Uttaranchal and Surat in Gujarat.

461. A. Pseudomonas

- Ecthyma gangrenosum is a cutaneous infection most commonly associated with Pseudomonas bacteraemia.
- Ecthyma gangrenosum usually occurs in patients who are critically ill and immunocompromised.
- The characteristic lesions of ecthyma gangrenosum are haemorrhagic (bloody) pustules that evolve into necrotic (black) ulcers.

462. B. Protein capsule plays an important role in pathogenicity

H. influenzae possesses polysaccharide capsule which plays an important role in pathogenesis.

463. D. Infection can be prevented by a acellular vaccine

- Acellular vaccine will prevent the disease and not the infection.
- It contains pertussis toxoid & FHA,pertactin or fimbriae.
- It is safer than whole cell vaccine

464. A. 7-14 days

- The incubation period of pertussis is commonly 7 to 10 days, with a range of 4–21 days.

465. B. Erythromycin should be given to contacts

- Protection is 85%
- Leukocytosis is a surrogate marker and not diagnostic
- DOC for Chemoprophylaxis is Erythromycin.

466. D. Bordetella pertussis

- The capsular antigen- K antigen is heat labile. These K antigens are of different types and are used for differentiating B. pertussis isolates in epidemiological studies.
- It is not acting as a virulent factor.

467. D. Filamentous hemagglutinin, pertussis toxin

- Acellular vaccine contains pertussis toxoid and more than two other bacterial components including FHA, pertactin or fimbriae

468. D. Brucella spp.

- Brucella is zoonotic disease. No Man to Man transmission.
- After an incubation period of 1 to 3 weeks, nonspecific symptoms such as fever,chills, fatigue, malaise, anorexia, and weight loss occur. The onset can be acute orgradual.
- The undulating (rising-and-falling) fever pattern that gives the disease itsname occurs in a minority of patients. Enlarged lymph nodes, liver, and spleen arefrequently found.
- Pancytopenia occurs.
- B. melitensis infections tend to be moresevere and prolonged, whereas those caused by B. abortus are more self-limited.
- Osteomyelitis is the most frequent complication. Secondary spread from person toperson is rare.

469. A. Standard agglutination test

- Standard tube agglutination test: This test remains the standard method and is the most commonly used serological testfor diagnosis of brucellosis.
- It detects the presence of antibodiesagainst LPS component of Brucella.
- It cannot differentiate acute and chronic stages of the disease

470. B. Brucella melitensis

- Malta fever, Undulant fever, Mediterranean fever are caused by Brucella melitensis.

471. D. Brucella melitensis

Refer Q. No 468

472. A. Man to man transmission

- Refer Q. No 468

473. D. 2 ME is used to detect IgA

- 2-mercaptoethanol is added to the patient's sera before testing it.

- Addition ofmercapto-ethanol causes disruption of disulfide bond of IgM; hence only IgG is detected.

474. A. Brucellosis

- This is a frequently used serological test fordemonstration of antibodies in the milk of an animal.
- This isa screening test used to detect the presence of Brucella infection in infected cattle.
- In this test, a concentrated suspension of killed B. abortus or B. melitensis stained with hematoxylin is usedas antigen.

475. B. Chancroid

- H. ducreyi is an important causative agent of sexually transmitted disease called soft sore or chancroid.

476. Hemophilus

- A suspected isolate ofH. influenzae is streaked on a blood agar plate. Then S. aureusis streaked across the same blood agar plate and incubatedat 37°C for 18–24 hours.
- After incubation, the colonies ofH. influenzae nearer to the S. aureus are larger than those awayfrom it. This phenomenon is known as satellitism.
- This demonstrates that V factor is available in increased concentration near the staphylococcal colony and in a lower concentration away from it.

477. C. Capsule

- Thecapsular K antigen is heat labile. These K antigens are ofdifferent types and are used for differentiating B. pertussis isolates in epidemiological studies.

478. C. Regan-Lowe medium

- Regan-Lowe medium is a selective medium for Bordetella pertussis.

479. A. Human is the only reservoir

- Campylobacter infections are zoonotic. Infected animals arethe main reservoir of the infection.
- The animal reservoirs arethe dogs, cats, and other pets that carry the organism in theirgastrointestinal tract.
- Infected animal food products are thesource of infection.

480. B. Culture on Skirrow's medium incubated at 42°C under microaerophilic condition

- Skirrow's medium is the selective medium for C. jejuni.
- C. jejuni is microaerophilic and grows well at 42^0C
- TCBS - Vibrio
- Wilson Blair medium - Salmonella

481. C. Gastric leiomyoma

- H. pylori associated with Gastric ulcer, Gastric lymphoma, adeno carcinoma.

482. A. With chronic infection urea breath test become negative

- UBT is prognostic test. Till the presence of the infection / organism UBT is positive.

483. C. Transmitted from man to man, Feco-orally and by oro- gastric route

- Humans are the primary reservoirs of infection.
- Poor hygiene, overcrowding, and poverty facilitatetransmission.
- The most likely route of H. pylori infection is eitherfecal-to-oral infection (from stool to mouth) or oral-to-oral(stomach contents transmitted from mouth to mouth) contact.

484. A. Campylobacter

- Example for Microaerophilc bacteria are
- C. jejuni
- H. pylori
- M. bovis
- L.interrogans

485. A. H. pylori

- H. pylori is the most potent urease producing microbe.

486. C. All children in developing countries have immunity by five years of age

- H. pylori infection induces the production of IgM, IgG, and IgAantibodies and also cellular immunity, but they do not appearto confer any protection against the disease

487. D. Urease activity provides protective environment to the bacilli

- H. pylori infection begins by colonization of gastric mucosa,which is facilitated by many virulence factors.
- H. pylori blocksthe production of acid by its acid-inhibitory protein andalso neutralizes the gastric acidity by production of ammonia by splitting urea by the enzyme urease.
- The biologicalactivity of urease is enhanced further by heat shock proteins.
- Finally,Helicobacter infection causes atrophic and even metaplasticchanges in the stomach.

488. A. Breath test

- Most sensitive invivo test for H. pylori is Urea breath test.
- H. pylori is the most potent urease producing microbe.

489. D. Colorectal cancer

- H. pylori resides in Gastric antrum.
- It causes gastric ulcers, Duodenal ulcer and gastric adeno carcinoma.

490. B. Skirrow's medium

- Skirrow's medium, Campy BAP medium, Blaser medium are the selective medium for C. jejuni
- BCYE medium – Legionella

491. A. Gram positive bacillus

- H. pylori is a curved, spiral, or S-shaped Gram-negative bacillus measuring 3 m in length and 0.5–0.9 m in breadth.
- Cork screw motilitydue to presence of a unipolar tuft of lophotrichous flagella.

492. C. Can grow at temperature around 42°C

- Darting motility due to Monotrichous flagella
- MCC of diarrhea in USA.
- Zoonotic disease

493. B. H.pylori

- A flagellum is a lash-like appendage that protrudes from the cell body of certain bacteria.
- Campylobacter jejuni& H. pylori has seven protofilaments.

494. B. Legionella

- Buffered charcoal yeast extract (BCYE) agarcontaining buffered charcoal, yeast extract, and cysteine isa useful medium for growth of L. pneumophila.
- L. pneumophila is a small, slender, pleomorphic, Gramnegative bacillus.

495. C. From inhalation of the aerosol in the air-conditioned room at convention center

- Person-to-person transmission does not occur. Animals also donot play any role in transmission of the infection
- Inhalation of aerosolized mist from contaminated watersource, which is contaminated with either the bacteria orfree-living amoeba infected with the bacteria.
- Nosocomial infection is transmitted through aspiration,contaminated water, or respiratory equipment.

496. A. Legionella

- Incubation period varies from 2 to 10 days.
- Pneumonia is the primary manifestation of Legionnaire's disease with multi-lobular consolidation, inflammation, and abscesses in the lung.
- Fever, chills, dry or nonproductive cough, and pleuritic or non- pleuritic chest pain are the common symptoms of the disease.
- Hyponatremia and diarrhea
- Extrapulmonary manifestations include myocarditis, pericarditis, and prostheticvalve endocarditis.

497. C. Legionella are communicable from infected patient to others

- Refer Q. No 495.

498. D. Legionella pneumophila

- Pontiac fever is a mild, self-limiting condition. The conditionpresents as fever and myalgia that resolve without treatment.

499. C. Legionella

- Refer Q. no 494

500. A. Legionella

- Refer Q. no 495

501. B. Legionella pneumophila

- Refer Q. No 494

502. B. Motile gram negative

- L. pneumophila is a small, slender, pleomorphic, Gramnegative bacillus.
- Motile in nature

503. B. Q fever

- No vector for human Q fever. It is zoonotic

504. C. Adult female feeds on vertebrate hosts

- Four stages of developmentusually take place in the life cycle of the mite.
- Of these stages,only larval stage (chigger) is infectious to humans and other mammals because these stages require blood meal for further development

505. C. Rickettsia prowazekii

- Louse is the vector for R. prowazekii.
- Epidemic typhus is characterized by highfever, severe headache, and chills.
- Appearance of a petechial ormacular rash on the fourth or fifth day – first starting on thetrunk and then spreading over to the extremities but withoutaffecting the face, palms, and sole – is the characteristic featureof the condition.
- This rash is seen in nearly 40% of patients

506. B. Trombiculid mite

- Genus Orientia contains Orientia tsutsugamushi, the causativeagent of scrub typhus.
- It is transmitted by Trombiculid mite

507. B. Flea is a vector of the disease

- Endemic typhus - Rats (Rattus rattus), mice,and cats are the natural reservoirs of infection. Humans arethe accidental hosts.
- Rat flea (Xenopsyllacheopis) or cat flea(Ctenocephalides felis) are the main vectors responsible for thetransmission of disease.

508. D. Epidemic typhus

- Refer Q. no 505.

509. D. Trombiculid mite

- Refer Q. no 506

510. A. Crimean Congo fever & B. Rocky mountain spotted fever

- Tick borne disease are Tick Typhus, Viral Encephalitis, Viral Fevers, Viral Hemorrhagic fevers (e.g. KFD), Tularemia, Tick Paralysis, Human Babesiosis.

511. A. McCoy cell line

- Chlamydia grows well in McCoy cell lines.
- It is obligate intra cellular organism.

512. B. Elementary body is metabolically active

- The reticulate body (RB) is a large, noninfectious form of Chlamydia.
- It is metabolically active and replicating form of Chlamydia.

513. D. The group specific antigen is responsible for the production of complement fixing antibodies

- Genus-specific antigenis a heat-stable, complement-fixing, and genus-pecificantigen.
- It is an LPS–protein complex resembling the LPS ofGram-negative bacilli. It is present in EBs and RBs.
- The antigencan be extracted by ether, chloroform, or methanol. The antigen is identified by CFT

514. B. Culture on McCoy cells

- Refer Q. No 296

515. A. Chlamydia trachomatis

- Chlamydia is the MCC of NGU
- H. ducreyi and Gonococci take Gram stain.
- Urethral discharge is not a feature of syphilis

516. D. Urethritis

- Serotype D – K causes adult inclusion conjunctivitis, neonatal conjunctivitis, infant pneumonia, and urogenital infections.

517. A. Infertility & C. Pelvic inflammatory disease

- Chlamydia trachomatis is the MCC of PID.
- The clinical manifestations in symptomatic patients includeurethritis (nongonococcal urethritis), epididymitis, proctitis, and conjunctivitis in males
- In females, it causes a mucopurulent cervicitis, endometritis, and salpingitis.
- Ascending infection can result in pelvic inflammatorydisease, chronic pelvic pain, and perinephritis.

518. D. Yolk sac inoculation

- C. trachomatis grows better in various tissue cultures, using nonreplicating stationary-phase cells. The bacteria can grow in a few cell lines, such as HeLa-229, McCoy, BHK-21, and buffalo green monkey kidney cells. McCoy and HeLa cells arefrequently used for the isolation of the bacteria.
- C. trachomatis can be grown by inoculation into embryonated eggs. Chlamydia spp. grow in yolk sac of 6–8 days old chickembryo.

519. A. Chlamydia trachomatis

- MCC of NGU is Chlamydia trachomatis
- H. ducreyi is Gram negative bacilli.
- MTB and T. pallidum not mainly involved in urethritis.

520. B. Nucleic acid amplification testing

- Molecular diagnosis of C. trachomatis infection is made by DNA probes and PCR (polymerase chain reaction). DNA probes are currently available, which detect the presence ofa species-specific sequence of 16S rRNA.
- PCR is used for diagnosis of infection with a reported sensitivity of 80–90% and specificity of 99%. The methodis useful specifically for testing urine specimens.

521. B. Endothelial cells of small vessels

- Rickettsiae are primary pathogens of arthropods, such as lice, fleas, ticks, and mites. In these hosts, they are found in theirintestinal tract.
- They are usually transmitted to humans by arthropod vectors, such as lice, mites, ticks, etc.
- They also infect humans in whom they arefound in the reticuloendothelial cells and vascular endothelium

522. B. Guinea worm infection&c. Plague

- Anthropozoonosis is defined as any disease that is transmitted from animals to humans.
- Examples are rabies, Brucellosis, Hydatid cyst...etc.

523. E. Pancreatitis

- Chlamydia causes trachoma,adult inclusion conjunctivitis, neonatal conjunctivitis,infant pneumonia, andurogenital infections.

524. C. Q-fever

- Q fever caused by Coxiella burnetti.

525. C. Lymphogranuloma venereum

- Esthiomene is a medical term referring to elephantiasis of the female genitals.
- In the past the term has also referred to elephantiasis of the male genitalia.
- Esthiomene is generally the visible result of lymphogranuloma venereum, lymphatic infection by Chlamydia trachomatis.

526. A. Rickettsial infection

- It helps to differentiate R. typhi which is positive and R. prowazekii which is negative for the test.
- It is otherwise called as tunica reaction.

527. C. M. leprae

- M. leprae is non cultivable. It does not obey Koch's second postulate.

528. B. Is an intracellular organism

- Chlamydiae are obligate intracellular parasites of humans and animals with marked affinity for the squamous epithelial cells
- of the gastrointestinal and respiratory tracts.

529. D. Coxiella burnetii

- C. burnetii is the causative agent of Q fever, a zoonotic disease transmitted from animals to humans.

530. D. Q fever

- Weil – Felix reaction is not useful in Q fever, Rickettsial pox and Trench fever.
- They failed to produce heterophile antibodies.

531. A. Rat flea

- Rat flea is the vector for endemic typhus
- Mite is for R.pox and scrub typhus
- Tick is for RMSF and Indian tick typhus.

532. C. Bartonella

- Bartonella can be isolated from blood in enriched blood agar.
- All other choices are non cultivable.

533. A. Rickettsiae

- Transovarian transmission is infection which can be spread to offspring.
- It is seen in tick born rickettsial diseases.

534. A. Rickettsiae

- Refer Q. no : 521

535. A. Gram positive

- Chlamydia can't be stained by Gram stain.
- It usually takes giemsa stain

536. B. Chlamydia

- Refer Q. no 528

537. A. OXK

- Scrub typhus is exclusively positive for OXK.

538. A. Weil-Felix reaction

- VDRL – Syphilis
- Rose – Waller – RA
- Paul Bunnel - EBV

539. B. Chlamydia

- Chlamydial Inclusion bodies are called as HP bodiesHalberstaedter–Prowazek bodies))

540. E. All of the above

- False positivity in VDRL seen in other conditions like Autoimmune disorders, Malaria...

541. A. Early relapsing syphilis

- Chancre redux is a condition defined as the recurrence of the primary sore at its original site
- Any lesion at the site of a healed primary has been labelled pseudochancre redux

542. A. VDRL

- Prognostic test for syphilis arenon specific tests.
- Example : VDRL and RPR

543. A. VDRL

- Refer Q. no : 542

544. A. T. pertenue & B. T. carateum

- Yaws – T. pertenue
- Pinta – T. carateum
- Bejel – T. endemicum

545. A. Leptospirosis

- Leptospiras infect various animals, including rats and other rodents, domesticlivestock, and household pets.

546. C. Microscopic agglutination test

- MAT depends on the ability of the patient's serumto agglutinate live leptospires obtained by culture.
- The MAT test uses a battery of live leptospires serovars commonlyprevalent in the area endemic for the disease.
- The MAT usesa battery of antigens taken from common leptospire serovars prepared from the leptospire-strains cultured on the media

547. D. Lice acts as reservoir of infection

- Rats and mammals are the reservoirs for leptospirosis.

548. B. Microscopic agglutination test

- It's a suspected case of leptospirosis.
- The gold standard test to diagnose leptospirosis is Microscopic slide agglutination test. (MSAT)

549. D. Weil Felix reaction

- Weil Felix reaction is a heterophile antibody detection test for rickettsial infections.
- All other choices are employed in the diagnosis of leptospirosis.

550. B. Weil's disease

- Aseptic meningitis is the most important clinical manifestation of leptospirosis.
- Profound jaundice, renal dysfunction, pulmonary dysfunction, hepatic necrosis, and hemorrhagic diastases areother severe manifestations

551. B. Borrelia

- Lyme disease is caused by bacteria, Borrelia burgdorferi that are transmitted to humans through a bite from an infected black-legged or deer tick.
- Symptoms can occur anywhere from 3 to 30 days after the bite and can be wide-ranging, depending on the stage of the infection.

552. B. Borrelia duttonii & D. Borrelia hermsii

- Humans are the only hosts. B. hermsii and b. Borrelia duttonii .
- They aretransmitted to humans by soft ticks (Ornithodoros).

553. A. IgM FTA - Abs

- Congenital syphilis is diagnosed by the demonstration of T.pallidum by DFM of umbilical cord, placenta, nasaldischarge, or skin lesion.
- IgM FTA ABS or IgM ELISA – IgM cannot crosses placenta

554. C. VDRL is negative in secondary syphilis

- All the serological tests including specific and non specific are 100% sensitive in secondary syphilis.

555. A. Borrelia burgdorferi

- Refer Q, no 551

556. B. Treponema pallidum

- Non cultivable organisms are Chalmydia, Rickettsia, M. leprae and Pathogenic T.pallidum.

557. A. Treponema pallidum

- Yaws is non venereal syphilis caused by Treponema pallidum pertenue

558. A. Borrelia

- They undergo antigenic variation.
- It does so by changing its outer surface protein(OSP). These OSPs vary antigenically within humans.

559. C. Relapsing fever

- Relapsing fever caused by Borrelia recurrentis
- Yaws – T. pertenue
- Pinta – T. carateum
- Bejel – T. endemicum

560. C. Schaudinn and Hoffman

- Frankel – Pneumococci
- Ogston – Staphylococus aureus
- Nicholas – C. tetani

561. D. 1,2 and 3

- VDRL and RPR are non specific tests
- TPPA, TPHA, TPI & FTA -Abs are

specific serological tests for syphilis by using treponemal antigens.

562. **E. TPPA**

- Currently the most specific test for syphilis is TPPA.
- The Treponema pallidum particle agglutination assay is an indirect agglutination assay used for detection and titration of antibodies against the causative agent of syphilis, Treponema pallidum subspecies pallidum.

563. **A. TPI**

- T. pallidum immobilization test detects the treponemal antibodies in patient's serum, whichimmobilize motile virulent T. pallidum.
- The test is performed by incubating live T. pallidum strains with test serum in thepresence of complement.
- If the serum contains treponemal antibodies, the treponemes become immobilized, which can be demonstrated under dark ground microscope

564. **B. Syphilis**

- Rapid plasma reagin (RPR) test is a popular test usedfor diagnosis of syphilis by demonstrating reaginic antibodies.
- The test uses VDRL antigen containing finely divided carbon particles suspended in choline chloride.
- The latter destroys inhibitory factors in the serum, thus avoiding the need to heat the serumbefore testing.
- Use of this antigen produces a clearer and welldefined flocculation reaction easily observed by the naked eye.

565. **A. Trypanosoma & C. Borrelia**

- Antigenic mutation seen in Neisseria gonorrhea, Tryponasoma brucei and Borrelia species

566. **D. 10 days - 90 days**

- Average time between infection with syphilis and the start of the first symptom is 21 days, but can range from 10 to 90 days.
- Syphilis blood test results will be negative during this time.

567. **A. Plasmids**

- Antigenic variation is a unique property exhibited by Borreliain humans.
- DNA rearrangement in linear plasmid present in Borrelia appears to be responsible:

568. **A. Rat**

- The main reservoir of leptospirosis is rat.
- The disease is otherwise called as rat fever

569. **C. Rat**

- Refer Q. No 568

570. **A. Fontana's**

- Silver impregnation method for treponema
- Fontana stain for fluid specimen
- Leviditi stain for tissue specimen

571. **B. FTA-ABS**

- It is specific serological test for syphilis.
- Currently this method is not recommended by CDC

572. **C. Vector borne disease**

- B. recurrentis caused relapsing fever
- Vector for epidemic type is Louse and endemic type id tick.

573. **All of the above**

- U. urealyticum is a sexually transmitted pathogen and causeschorioamnionitis, prematurity, vaginitis, cervicitis, acute salpingitis, and pelvic inflammatory disease in women.
- Ureaplasma organisms are most frequently isolated from infants, particularly girls.
- The bacteria also cause urethritis, proctitis, balanoposthitis, and Reiter's syndrome in men

574. **A. They are inhibited by Penicillins**

- Mycoplasma are devoid of cell wall.

- Penicillin acts on cell wall.
- So penicillin is ineffective against Mycoplasma.

575. A. Mycoplasma

- Cold agglutination test: In this test, human O group erythrocytes are used as antigen.
- This is based on the principle that autoantibodies that agglutinate human O group cells at low temperatures appear in most of the cases of atypicalpneumonia.

576. B. Mycoplasma

- Mycoplasma are naturally devoid of cell wall.

577. A. Mycoplasma

- Mycoplasma colonies are best stained by Diene method.

578. C. Require cholesterol for growth

- Devoid of cell wall.
- Grows in artificial culture medium – PPLO agar
- Needs cholesterol for their growth.

579. B . Acinetobacter baumanni

- Haemophilusaphrophilus and Haemophilus paraphrophilus,
- Actinobacillusactinomycetemcomitans
- Cardiobacterium hominis
- Eikenella corrodens
- Kingella kingae.

580. A. HME

- Ehrlichia chaffeensis is a member of the Rickettsia family and causes human monocytic ehrlichiosis (HME). This disease resembles Rocky Mountain spottedfever, except that the typical rash usually does not occur.
- High fever, severe headache, and myalgias are prominent symptoms. The organism is endemic in dogs and is transmitted to humans by ticks, especially the dog tick, Dermacentor, and theLone Star tick, Amblyomma.
- Ticks of the genus Ixodes are also vectors. E. chaffeensis primarily infects mononuclear leukocytes and forms characteristicmorulae in the cytoplasm.

Virology — Questions

581. The vector of Japanese B encephalitis virus is :
a. Anopheles mosquito
b. Culex mosquito
c. Aedes mosquito
d. All of these

582. Regarding Hepatitis E, it is true that:
a. Occurs with Hepatitis B
b. Is single stranded DNA virus
c. Occurs along with HIV
d. Increases mortality in pregnancy

583. Virus implicated in nasopharyngeal carcinoma is
a. Herpes
b. Adenovirus
c. Corona virus
d. EBV

584. Diagnostic of Rabies
a. Guarneri bodies
b. Negri bodies
c. Cowdry A body
d. Cowdry B body

585. Arbovirus – True is
a. Yellow fever is endemic in India
b. Dengue has only one serotype
c. KFD was first identified in West Bengal
d. Chikungunya is transmitted by Aedes

586. Which of the viral disease is tick borne
a. Kyasanur forest disease
b. Chikungunya
c. Yellow fever
d. Dengue

587. Live vaccine except
a. Hepatitis B
b. Sabin
c. 17D (yellow fever)
d. BCG

588. All the following hepatitis viruses are RNA viruses except
a. Hepatitis A virus
b. Hepatitis B virus
c. Hepatitis C virus
d. Hepatitis D virus

589. Commonest cause of acute Bronchiolitis in children is
a. Adeno virus b. RSV
c. Klebseilla d. Staphylococci

590. Genetic reassortment is found in
a. Hepadna virus b. Parvo virus
c. Rota virus d. Astro virus

591. Regarding varicella false is
a. Produces rash in flexor surface of fore arm
b. Single stage lesions are found at a time
c. Secondary infection rate is >90%
d. Vaccine protection rate is high

592. Chlorination does not affect
a. Salmonella b. Shigella
c. HIV d. Polio virus

593. The Tzank test is used for diagnosing (PGI)
a. Herpes simplex
b. Impetigo
c. carbuncle
d. Chickenpox

594. Demonstration of inclusion bodies is diagnostic in all of the following except
a. Chicken pox
b. Rabies
c. Molluscum contagiosum
d. Trachoma

581. b	582. d	583. d	584. b	585. d	586. a	587. a	588. b	589. b	590. c
591. b	592. d	593. a,d	594. a						

595. Subclinical infection is not seen with
a. Diphtheria
b. Polio
c. Measles
d. Staphylococcus aureus

596. Glandular fever like syndrome is produced by all except
a. Cytomegalovirus
b. Toxoplasma gondii
c. Infectious mononucleosis
d. Herpes simplex type II

597. Paul bunnel test is used for
a. Malta fever
b. Enteric fever
c. Infectious mononucleosis
d. Typhus fever

598. Pharyngitis is most often caused by
a. Viruses
b. Pneumococcus
c. Streptococcus
d. Corynebacterium

599. Tiger mosquitoes are
a. Ticks b. Culex
c. Anopheles d. Aedes

600. Pneumonia is caused by all except
a. Influenza b. Varicella
c. CMV d. Mumps

601. A 9- Month-old infant presents to the 'diarrhea clinic' unit with some dehydration. The most likely organism causing diarrhea is:
a. Entamoeba histolytica
b. Rotavirus
c. Giardia lamblia
d. Shigella

602. Early diagnosis of acute hepatitis-B infection is made by:
a. Presence of HbeAg in serum
b. Presence of IgM Anti-Hbc in serum
c. Presence HbsAg in serum.
d. Presence of IgG anti-HBc in serum

603. An 8year old child recently had erythema infectiosum. Her 33 year old mother subsequentlydeveloped arthralgia followed by painful arthritis with swelling in the small joints of both hands.In addition to the apparent tropism for joints, human parvovirus B 19 is highly tropic for whichcell type?
a. CD4 T lymphocytes
b. Renal tubules cells
c. Erythroid cells
d. Glial cells
e. Peyer' s patches

604. A 20year old female presented to her physician with a low grade fever, headache, and painful genital lesions. Culture detects herpes simplex virus. Which of the following statements best describes infection with this common human pathogen?
a. Infection with type I virus is most common
b. Initial infection usually occurs by intestinal absorption of virus
c. It can be reactivated by emotional disturbances or prolonged exposure to sunlight
d. It rarely recurs in host who has high antibody titer
e. The CNS and visceral organs are usually involved

605. Echoviruses are cytopathogenic human viruses that mainly infect which of the following?
a. Bladder and urinary tract
b. Blood and lymphatic system
c. Central nervous system
d. Respiratory system

606. A 10 year old boy is taken to his pediatrician after experiencing fever, malaise, and anorexia, followed by tender swelling of his parotid glands. Mumps was diagnosed on clinical presentation.Which of the following characterizes infection by this virus?
a. Is apt recur periodically in many affected persons
b. Is maintained by a large canine reservoir
c. Is preventable by immunization
d. Usually produces severe systemic manifestations
e. Belongs to Orthomyxovirus

595. c	596. d	597. c	598. a	599. d	600. d	601. b	602. b	603. c	604. c
605. c	606. c								

607. Two siblings, ages 2 and 4, experienced fever, rhinitis, and pharyngitis that resulted inlaryngotracheobronchitis. Both had harsh cough and hoarseness. Which virus is could beresponsible for this condition?

a. Adenovirus
b. Group B coxsackievirus
c. Parainfluenza virus
d. Rhino virus
e. Rota virus

608. An immunocompromised person with a history of seizures had an MRI that revealed atemporal lobe lesion. Brain biopsy results showed multinucleated giant cells with intranuclearinclusions. The most probable cause of the lesion is which of the following?

a. Coxsackievirus
b. Hepatitis C virus
c. Herpes simplex virus 1
d. Herpes simplex virus 2
e. Parvovirus

609. Parvovirus infection, the cause of a mild exanthem in children, can also cause which of thefollowing?

a. Aplastic crisis
b. Acute respiratory disease
c. Gastroenteritis
d. Keratoconjunctivitis

610. Within the first year of life, an infant exhibited severe hearing loss, ocular abnormalities, and apparent mental retardation. Cytomegalovirus infection was detected by viral isolation and PCR.Which of the following statements best characterizes CMV?

a. It can be transmitted across the placental barrier
b. While a common infection, CMV is almost always symptomatic
c. The CMV can be cultured from red blood cells of infected patients
d. Unlike other viral infections, CMV is not activated by immune-suppressive therapy
e. There is no specific therapy for CMV

611. All are associated with HHV-6 except

a. Fifth disease
b. Roseola Infantum
c. Double stranded DNA virus
d. Exanthem subitem

612. What is true about Human Papillomaviruses (HPV)?

a. Papillomavirus infection is commonly diagnosed by viral culture
b. HPV-6 and HPV-18 are mainly sexually transmitted
c. HPV-16 and HPV-11 are mostly associated with cervical cancers
d. Are associated with progressive multifocal leukoencephalopathy

613. All are true about Influenza A virus except

a. May cause antigenic shift and antigenic drift
b. May cause pandemics
c. Vaccination offers lifelong protection
d. Responds to neuraminidase inhibitors

614. All are true about Respiratory Syncytial Viruses except:

a. May cause bronchiolitis
b. Is an RNA virus
c. May be prevented by vaccination
d. Belongs to paramyxovirus

615. All of the following may be present in chronic HBV infection except

a. HBeAg
b. HBV-DNA
c. HBsAg
d. Anti-HBc IgM

616. All of the following is true except

a. HCV belongs to flavivirus
b. No vaccine available for Hepatitis E
c. HBV is a DNA virus
d. HDV is defective virus

617. Which of the following viruses isclosely associated with exanthema subitum?

a. Parvovirus B19
b. Human herpesvirus 6
c. Rubella virus
d. Rubeola virus

607. c	608. c	609. a	610. a	611. a	612. b	613. c	614. c	615. d	616. b	617. b

618. An individual who has received all three doses of hepatitis B vaccine and who has never had hepatitis B virus (HBV) infection would be expected to have which of the following serologic marker(s)?

a. HBcAb
b. HBsAb
c. HBeAb
d. HBeAb and HBsAb

619. Acute infantile diarrhea is most commonly due to infection with which of the following?

a. Enteroviruses
b. Rotaviruses
c. Noroviruses
d. Enteric adenoviruses

620. Which of the following viruses is spread by way of nerves?

a. Rabies
b. Varicella-zoster
c. Herpes simplex
d. All of the above
e. None of the above

621. A 25 years old 2nd gravida lady is in her 1st trimester pregnancy. Her son aged 4 has developedchicken pox at home since 1 day. She does not give any history of chicken pox and is varicella IgGnegative.What is advised for the mother?

a. Varicella zoster immunoglobulin
b. Oral Acyclovir
c. Both VZ immunoglobulin and oral Acyclovir
d. Nothing, only reassurance

622. Post exposure prophylaxis for HIV should be started preferably within

a. 2 hours of exposure
b. 4 hours of exposure
c. 72 hours of exposure
d. 20 minutes of exposure

623. All of the following methods are used for the diagnosis of HIV infection in a 2 months oldchild except

a. DNA-PCR
b. Viral culture
c. HIV ELISA
d. p24 antigen assay

624. Antenatal maternal HIV diagnosis is of importance to

a. Prevent vertical transmission
b. Terminate
c. Discharge
d. Isolate the patient

625. After vaccination for Hepatitis B the following viral marker should be measured to ascertain whether the vaccinee is a responder or non responder

a. HBsAg
b. Anti HBsAg
c. IgM Anti HBcAg
d. IgM Anti HBeAg

626. A mother is HBsAg positive at 32 weeks of pregnancy. What should be given to the newborn toprevent neonatal infection

a. Hepatitis B vaccine + immunoglobulins
b. Immunoglobulins
c. Hepatitis B vaccine only
d. Immunoglobulin followed by vaccine 1 month later

627. Detection of Dengue within 5 days can be done by

a. NS 1 Antigen detection
b. MAC ELISA
c. ICT test to detect IgM
d. None of the above

628. The best technique to detect growth in cell line cultures is

a. CPE
b. Haemadsorption
c. Immunofluoresence
d. Interference

629. To culture influenza virus for vaccine development in chick embryo the best place for inoculation is

a. CAM
b. Allantoic cavity
c. Amniotic cavity
d. Yolk sac

618. b	619. b	620. d	621. a	622. a	623. c	624. a	625. b	626. a	627. a
628. c	629. b								

630. For Hepatitis A vaccination all are true except

a. In low-endemicity regions, vaccination is only for high-risk individuals
b. In intermediate-endemicity regions, vaccination is required
c. In high-endemicity regions, vaccination is not required
d. Anti-HAV antibody testing has no role in determining vaccination.

631. A young female presents to her physician with low grade fever, headache and painful genital lesions. Culture detects HSV. Which of the following best describes infection with this commonhuman pathogen?

a. Infection with type 1 virus is most common
b. Initial infection usually occurs by intestinal absorption of the virus
c. It can be reactivated by emotional disturbances or prolonged exposure to sunlight
d. It rarely recurs in a host who has a high antibody titre

632. A 9 years old male presents with fever and nonspecific symptoms followed by distinctive rashon the cheeks (slapped cheek). Which of the following viruses is the most likely cause of this disease and has been associated with transient aplastic crisis in persons with sickle cell disease?

a. Herpes simplex b. Parvovirus B19
c. Rubella d. Rubeola

633. EB virus is associated with all except

a. Infectious mononucleosis/glandular fever
b. Progressive lymphoproliferative disease in transplant recipients, immunodeficient, AIDS
c. B-cell lymphoma in transplant recipients & AIDS
d. Oropharyngeal Ca

634. All are true regarding CMV except

a. Replicates in epithelial cells of salivary glands, kidneys & respiratory epithelium
b. Infected persons carries virus for life and is secreted in all body secretions
c. MC agent to cause intrauterine infection of the fetus
d. IgG detection by ELISA is used for diagnosis

635. All are true regarding HHV6 and HHV7 except

a. Infects CD4 T- lymphocytes & Macrophages
b. Reservoir is the salivary glands
c. Exanthema subitum/Roseola infantum is associated
d. Kaposi's sarcoma is associated

636. All are true regarding adeno virus except

a. Causes Pharyngoconjunctival fever with types 3,4,7,14
b. Causes infantile gastroenteritis with type 40 & 41
c. Causes acute hemorrhagic cystitis in infants & children with 11 & 21
d. Rounding & aggregation of cells (grape like clusters) with basophilic, I/N IB Cowdry type A

637. All are true regarding molluscum contagiosum except

a. Painless, umbilicated, pearly white nodules on trunk & anogenital area
b. Inverted fir tree appearance
c. Molluscum bodies are diagnostic
d. Do not spread by direct contact

638. All are true about Papova virus except

a. Nonenveloped, icosahedral, dsDNA
b. Cervical Cancer is caused by Papilloma virus type 6, 11
c. JC polyoma virus causes progressive multifocal leuco-encephalopathy in patients of Hodgkin's,CLL, AIDS
d. BK polyoma virus persists in kidney for life

639. The marker to detect superinfection of Hepatitis D in Hepatitis B patient is

a. HBsAg b. Anti HBsAg
c. IgG anti HBc d. IgM anti HBc

630. d	631. c	632. b	633. d	634. d	635. d	636. d	637. d	638. b	639. c

640. Vaccine may be developed in all the following except

a. Chick embryo
b. Vero cell line
c. HeLa cell line
d. Diploid cell line

641. A 29-year-old female diagnosed with AIDS has been suffering from a progressive blurring ofvision in her right eye. On funduscopic examination, a small white opaque lesion is noted on the retina of her right eye. Which of the following is the most appropriate therapy for this patient?

a. Acyclovir
b. Amantadine
c. Flucytosine
d. Ganciclovir

642. Following statement is true regarding antigenic drift in influenza virus

a. It occurs once in 10-20 years
b. It is responsible for pandemics
c. It is seen only in influenza type A virus
d. Results from genetic recombination of human with animal
e. It is due to immunity selection to the group of the viruses existing in the community

643. Which of the following statement is true regarding arboviruses

a. Yellow fever is endemic in India
b. Dengue virus has only one serotype
c. Kyasanur forest disease (KFD) is transmitted by ticks
d. Mosquito of culex vishnui complex is the vector of dengue fever
e. Japanese encephalitis is transmitted by Aedes

644. Thirty year old man presented with nausea, fever and jaundice of 5 days duration. Thebiochemical tests revealed a bilirubin of 6.7 mg/dl (conjugated 5.0 mg/dl) with SGOT/SGPT(AST/ALT) of 1230/900 IU/ml. The serological tests showed the presence of HBsAg, IgM anti HBc and HBeAg. The most likely diagnosis is

a. Chronic hepatitis B infection with high infectivity
b. Acute hepatitis B infection with high infectivity
c. Chronic hepatitis B infection with low infectivity
d. Acute hepatitis B infection with low infectivity
e. Hepatitis B vaccinated individual presenting with obstructive jaundice

645. Human to human transmission is not seen in

a. SARS
b. Japanese B encephalitis
c. H5N1
d. Poliomyelitis
e. HIV

646. An otherwise healthy 3-year-old child is brought to the pediatrician with umbilicated, fleshcolored papules on his trunk. This condition is related to infection with which of the followingviruses?

a. Cytomegalovirus
b. Herpesvirus 6
c. Parvovirus
d. Poxvirus

647. HIV affects all the following cells except

a. T helper cells
b. Macrophages
c. NK cells
d. B lymphocytes
e. Follicular dendritic cells

648. Emergence or resurgence is seen in which of the following organism(s) (PGI)

a. Poliovirus
b. Measles virus
c. Nipah virus
d. West Nile virus
e. Hepatitis B virus

649. In March 2003, Avian influenza outbreak in Netherlands was caused by

a. H5N1
b. H7N7
c. H9N2
d. H3N1
e. H5N2

650. Natural reservoir of Hendra virus is

a. Horse
b. Man
c. Bat
d. Pig
e. Duck

640. c	641. d	642. e	643. c	644. b	645. b	646. d	647. c	648. c, d	649. b
650. c									

651. Which of the following is a primary cell culture:

a. Chick embryo cell culture
b. Hela
c. HEP-2
d. HL-8

652. Human fibroblast cell line is used for cultivation of:

a. Adenovirus
b. Polio
c. HIV
d. Measles

653. A neonate develops encephalitis without any skin lesions; most probable causative organism is:

a. HSV-I
b. HSV-II
c. Meningococci
d. Streptococci

654. A 29-year-old person comes with focal seizures. MRI shows frontal and temporal enhancement. What is the most probable diagnosis:

a. Meningococcal meningitis
b. Herpes simplex encephalitis
c. Japanese encephalitis
d. Enterovirus encephalitis

655. Infectivity of chickenpox lasts for:

a. Till the last scab falls off
b. 6 days after onset of rash
c. 3 days after onset of rash
d. Till the fever subsides

656. A 40-year-old man underwent kidney transplantation. Two months after transplantation, he developed fever and feature suggestive of bilateral diffuse interstitial pneumonia. Which of the following is most likely etiologic agent?

a. Herpes simplex virus
b. Cytomegalovirus
c. Epstein-Barr virus
d. Varicella - zoster virus

657. A patient has undergone a renal transplantation 2 months back and now presented with difficult breathing. X-ray showed bilateral diffuse interstitial pneumonia. The probable etiologic agent would be:

a. CMV
b. Histoplasma
c. Candida
d. Pneumocystis carinii

658. Renal involvement is seen in which of the following infections? (PGI)

a. Cytomegalovirus
b. Polyoma virus
c. Human papilloma virus
d. HIV
e. HBV

659. In a patient with a vesicle on shin. Microscopy on Tzank smear showed giant cells. Causative agents is:

a. Vaccinia virus
b. Varicella zoster
c. Tuberculous
d. Molluscum contagiosum

660. Hypoplasia of limb and scarring is caused by:

a. Varicella
b. Herpes simplex
c. Rubella
d. Toxoplasma

661. Virus causing hemorrhagic cystitis, diarrhea and conjunctivitis is :

a. RSV
b. Rhinovirus
c. Adenovirus
d. Toxoplasma

662. Vaccine preparation requires which virus as vector: (PGI)

a. Rhinovirus
b. Vaccinia
c. Adenovirus
d. Ebola
e. Hepatitis B

663. About parvovirus B19 all are true except

a. Spread by respiratory route
b. Has affinity for erythrocyte progenitor cells
c. Causes transient aplastic crisis
d. Transplacental transfer occurs in only 10% of cases

664. Most sensitive test for diagnosis of infectious mononucleosis:

a. Monospot test
b. Paul Bunnel test
c. Lymphocytosis in peripheral smear
d. Culture of the virus

651. a	652. a	653. b	654. b	655. b	656. b	657. a	658. a,b,d	659. b
660. a	661. c	662. b,c	663. d	664. a				

665. Which disease has viral etiology?
a. Myeloma
b. Nasopharyngeal Ca
c. Sarcoidosis
d. Hemophilia

666. True about virus is:
a. HSV-I causes encephalitis
b. EBV affects T lymphocyte
c. CMV is always symptomatic
d. Herpes zoster is not reactivated

667. Which virus remains dormant but reactivates later ?
a. HIV b. VZV
c. HBV d. HPV

668. Which virus reactivates and involves the eyes:
a. Herpes- zoster
b. CMV
c. EB virus
d. Enterovirus – 70

669. All are true regarding cytomegalovirus except:
a. It is DNA virus.
b. Most commonly infected in the last trimester
c. Diagnosed by increased IgA in fetal blood
d. Most common cause of congenital viral infection

670. Erythema infectiosum is caused by:
a. Human parvovirus B-19
b. Papova virus
c. Human herpes virus type 8
d. Measles virus

671. Which one given below is a DNA virus?
a. Poliovirus
b. Adenovirus
c. Parvovirus
d. Hepatitis-A virus

672. Most common extra skin manifestation of varicella is involvement of:
a. CNS b. Lungs
c. Kidneys d. CVS

673. Oral hairy leukoplakia caused by:
a. Ebsteinbarr virus
b. CMV
c. HIV
d. HZV

674. Adenovirus:
a. Double stranded DNA
b. Enveloped
c. Complex symmetry
d. None

675. African Burkitt's lymphoma is caused by:
a. Cytomegalovirus
b. EB virus
c. Herpes zoster
d. Infectious mononucleosis

676. All of the following are true about Herpes group of viruses except:
a. Ether-sensitive
b. May cause malignancy
c. HSV II involves below diaphragm
d. Burkitt's lymphoma involves T-cells

677. Varicella are classified under:
a. Enterovirus b. Retrovirus
c. Poxvirus d. Herpes virus

678. Human papilloma virus contains:
a. ssRNA b. dsDNA
c. ssRNA d. ssDNA

679. EBV causes:
a. Nasopharyngeal Ca
b. CRF
c. P. versicolor
d. None

680. Congenital varicella infection causes all except:
a. Macrocephaly
b. Limb hypoplasia
c. Cortical atrophy
d. Cicatrix

681. Which pox won't grow in egg, animal cells:
a. Cow pox b. Vaccinia
c. Variola d. Molluscum

665. b	666. a	667. b	668. a	669. c	670. a	671. b	672. a	673. a	674. a
675. b	676. d	677. d	678. b	679. a	680. a	681. d			

682. HHV-8 causes:
a. Burkitt's lymphoma
b. Nasopharyngeal carcinoma
c. Kaposi's sarcoma
d. Hepatic carcinoma

683. Slapped cheek sign is seen in:
a. Parvovirus B19
b. JC virus
c. Rota virus
d. Mumps

684. Pharyngoconjunctival fever is caused by:
a. Adenovirus 3 and 7
b. Adenovirus 11, 21
c. Adenovirus 40, 41
d. Adenovirus 8,10

685. Brick-shaped virus:
a. Chicken pox
b. Small pox
c. CMV
d. EBV

686. All of the following statements are true regarding polio- virus except:
a. It is transmitted by Feco-oral route
b. Asymptomatic infections are common in children
c. There is a single serotype causing infection
d. Live attenuated vaccine produces herd immunity

687. All of the following clinical features are associated with enteroviruses except:
a. Myocarditis
b. Pleurodynia
c. Herpangina
d. Hemorrhagic fever

688. All are false regarding polio virus except:
a. Most cases are symptomatic
b. Inactivated vaccine given I/M
c. Inactivated polio vaccines are given to child less than 3 years of age
d. Only one type exists

689. Enterovirus causes all except:
a. Hemorrhagic fever
b. Pleurodynia
c. Herpangina
d. Aseptic meningitis

690. H_5N_1 is:
a. Bird flu virus
b. Vaccine for HIV
c. Causative agent of Japanese encephalitis
d. An eradicated virus

691. Segmented RNA is found in:
a. Influenza virus
b. Rabies virus
c. Herpes virus
d. Molluscum contagiosum virus

692. Commonest complication of Mumps is:
a. Orchitis and Oophoritis
b. Encephalitis
c. Pneumonia
d. Myocarditis

693. Regarding mumps, which is true?
a. Causes SSPE
b. Mumps causes aseptic meningitis in children
c. Sublingual gland is involved commonly
d. All

694. Vaccination causing intussusception:
a. Rotavirus
b. Parvovirus
c. Inactivated polio d. BCG
d. Measles

695. Reassortment is typically seen in:
a. Herpes b. Hepadna
c. Rotavirus d. Astrovirus

696. Vaccines prepared by embryonated hen's egg are:
a. Measles b. Rabies
c. Rubella d. Varicella

682. c	683. a	684. a	685. b	686. c	687. d	688. b	689. a	690. a	691. a
692. a	693. b	694. a	695. c	696. b					

697. Class II exposure in animal bites includes the following:

a. Scratches without oozing of blood
b. Licks on a fresh wound
c. Scratch with oozing of blood on palm
d. Bites from wild animals

698. A 25-year-old girl has been admitted to the hospital with provisional diagnosis of rabies. The most suitable clinical sample that can confirm the antemortem diagnosis is:

a. Serum for antivirus IgG antibody
b. skin impression smear for immunofluorescence stain
c. CSF sample for viral culture
d. Giemsa stain on smear prepared from salivary secretions

699. A boy got unprovoked bite from a neighbor's dog. The animal control authority caught the dog and it was found to be healthy. What will be the next step?

a. Test antibody level in the dog
b. Withhold immunization and observe the dog for 10 days for signs of rabies
c. Start post-exposure prophylaxis
d. Perform euthanasia for the dog

700. Diagnostic of Rabies:

a. Guarneri bodies
b. Negri bodies
c. Cowdry A body
d. Bollinger bodies

701. Soft tick transmits:

a. Relapsing fever
b. KFD
c. Tick typhus
d. Tularemia

702. Which is true about arboviral disease?

a. Yellow fever is endemic in India
b. Dengue viruses have only one serotype
c. KFD is transmitted by ticks
d. Japanese encephalitis is transmitted by Aedes

703. Mark true in following:

a. Hanta virus pulmonary syndrome is caused by inhalation of rodent urine and feces
b. Kyasanur forest disease is caused by bite of wild animal
c. Lyssa virus is transmitted by ticks
d. Chikungunya is caused by anopheles

704. Most specific for Dengue diagnosis

a. IgM Capture ELISA
b. Tissue culture
c. CFT
d. Electron microscopy

705. True about dengue fever. (PGI)

a. Caused by 5 serotypes
b. Effective vaccine is available
c. Presents with fever and joint pain
d. Virus belongs to Flavivirus genus
e. Contain segmented RNA

706. All of the following statements are true about congenital rubella except:

a. It is diagnosed when the infant has IgM antibodies at birth
b. It is diagnosed when IgG antibodies persist for more than 6 months
c. MC congenital defects are deafness, cardiac malformation and cataract
d. Infection after 16 weeks of gestation result in major congenital defects

707. Laboratory diagnosis of viral respiratory tract infections can be established by all of the following tests except:

a. Detection of virus specific IgM antibodies in single serum specimen
b. Demonstration of viral antigens by indirect immunofluorescence assay in nasopharyngeal washings
c. Isolation of viruses using centrifugation enhanced culture
d. Detection of viral hemagglutination inhibiting (HAI) antibodies in a single serum specimen

697. b	698. b	699. b	700. b	701. a	702. c	703. a	704. a	705. a,d	706. d
707. d									

708. A 11-month-old child presents with complaints of respiratory distress. On examination there is bilateral crepitation and wheezing. Which of the following is the most likely cause?

a. Pneumonia
b. Adenovirus
c. Respiratory syncytial virus
d. Rhinovirus

709. Choose the correct matches: (PGI)

a. Mumps-RA 27/3 strain
b. Rubella-Jeryl-Lynn strain
c. Measles-Edmonston-Zagreb strain
d. BCG-Danish 1331 strain

710. Organism (s) causing, bronchiolitis in infant: (PGI)

a. RSV
b. Rhinovirus
c. Parainfluenza
d. Influenza
e. H. influenzae

711. New infectious agents are: (PGI)

a. Nipah virus
b. Pneumocystis jerovecii
c. Corona virus
d. SARS
e. Prion

712. True about Crimean-Congo hemorrhagic fever EXCEPT:

a. Zoonosis
b. Develop petechial rashes
c. Transmitted by mites
d. Recently disease has been reported in Gujarat

713. Man is the only reservoir of:

a. Rabies
b. Influenza
c. Typhoid
d. Japanese B encephalitis

714. In India, human infections have been reported dengue virus type:

a. Types I and 1
b. Types 1 and 3
c. Types 2 and 4
d. Type 1 only
e. All 4 types

715. Pre-exposure cell culture vaccine used in Rabies

a. 3 doses b. 4 doses
c. 5 doses d. 6 doses

716. Diarrrhea in Rotavirus infection is due to:

a. Increased intestinal hypermotility
b. Decreased absorption by villi
c. Increased Secretion by villi
d. None of the above

717. Recommended vaccines for rabies:

a. DPT b. MMR
c. BCG d. HDCV

718. Break bone fever is caused by which virus:

a. Variola b. Coxsackie
c. Dengue d. Adenovirus

719. Commonest cause of Bronchiolitis is:

a. RSV b. Adenovirus
c. Influenza d. Herpesvirus

720. Which of the following is true regarding influenza:

a. It is caused by an enveloped DNA virus
b. Laboratory studies may show neutropenia early in the course of disease
c. Primary infectious pneumonia is less common than secondary bacteria pneumonia
d. Antiviral agents are given early prevents complications

721. Negri bodies are seen in infections due to:

a. Poliovirus b. Rabies virus
c. Herpesvirus d. Adenovirus

722. A vaccine for rabies was first developed by:

a. Louis Pasteur
b. Robert Koch
c. Edward Jenner
d. Landsteiner

708. c	709. c,d	710. a,c,d	711. a,c,d	712. c	713. c	714. e	715. a	716. b
717. d	718. c	719. a	720. c	721. b	722. a			

723. Which of the following viruses is composed of two distinct capsids enclosing the double stranded RNA?
a. Adenovirus
b. Reovirus
c. Herpes virus
d. Myxovirus

724. Type of vaccine available commercially for rabies are all except:
a. Inactivated sheep brain vaccine
b. Genetically engineered glycoprotein vaccine
c. Duck embryo cultured vaccine
d. Human diploid cell vaccine

725. Rotaviruses are responsible for:
a. Acute nonbacterial gastroenteritis in adults
b. Infantile diarrhea
c. Teratogenic effects
d. Respiratory tract infection in immunocompromised individuals

726. Reverse transcriptase polymerase chain reaction can aid in diagnosis of all of the following viral infection except:
a. Adenovirus b. Astrovirus
c. Rotavirus d. Poliovirus

727. All of the viruses cause pneumonia except:
a. Cytomegalovirus
b. Mumps
c. Measles
d. Retrovirus

728. Conjunctivitis is caused by all except:
a. CMV
b. Enterovirus 70
c. Coxsackie A 24
d. Adenovirus

729. All of them are cultivable virus except:
a. Rotavirus
b. Enterovirus
c. ECHO virus
d. Coxsackie virus

730. All of the following rabies vaccines are commercially available except:
a. Killed sheep brain vaccine
b. Human diploid cell vaccine
c. Vero continuous cell vaccine
d. Recombinant glycoprotein

731. Rabies virus is inactivated by:
a. Phenol
b. UV radiation
c. BPL (Beta propiolactone)
d. All

732. Antirabies vaccine is prepared by
a. Street virus
b. Fixed virus
c. Line virus
d. Wild virus

733. Swine flu is caused by:
a. H1N1 b. H5N1
b. H3N1 d. H2N3

734. Non-enveloped ssRNA virus is:
a. Picornavirus
b. Poxvirus
c. Retrovirus
d. Bunyavirus

735. Most virulent dengue fever strain is:
a. 1 b. 2
c. 3 d. 4

736. Antigenic shift:
a. Occurs every 2-3 years
b. Gradual change over time
c. Result from genetic recombination
d. Occurs in all influenza viruses

737. Herpangina is caused by:
a. Coxsackie A
b. Rhinoviruses
c. Myxovirus
d. Rabies virus

738. Hemorrhagic fever is caused by:
a. West-Nile fever
b. Sandfly fever
c. Ebola virus
d. All of the above

723. b	724. b	725. b	726. a	727. b	728. a	729. a	730. d	731. d	732. b
733. a	734. a	735. b	736. c	737. a	738. c				

739. Suckling mice is used for isolation of:
a. Coxsackie Virus
b. Pox
c. Herpes
d. Adeno Virus

740. False about Polio:
a. Descending Paralysis
b. Bilateral symmetrical
c. Non-progressive
d. LMN type paralysis

741. Appearance of Cowdry type A inclusion bodies
a. Granular b. Circumscribed
c. In polio d. None

742. Classic tried of congenital rubella includes all except
a. Cataract b. Deafness
c. Retinitis d. CHD

743. Most common oncogenic RNA virus
a. Retrovirus
b. Picornavirus
c. Orthomyxovirus
d. Paramyxovirus

744. Which is enveloped virus?
a. Dengue Virus
b. Norwalk Virus
c. Hep A Virus
d. Adeno Virus

745. Which of the following is not prion associated disease:
a. Scrapie
b. Kuru
c. Creutzfeldt-Jakob disease
d. Alzheimer's disease

746. True about Prion disease is all except:
a. Myoclonus is seen in 10% of the patients
b. Caused by infectious protein
c. Brain biopsy is diagnostic
d. Commonly manifests as dementia

747. Mad cow disease is due to:
a. Slow virus
b. Mycoplasma
c. Bacteria
d. Fungus

748. Fatal familial insomnia is associated with:
a. Prion disease
b. Degenerative disease
c. Neoplastic disease
d. Vascular disease

749. Creutzfeldt-Jakob disease is caused by: (PGI)
a. Prion
b. JC virus
c. Genetic factors
d. Nutritional deficiency

750. Which of the following infection agent lacks RNA:
a. Virus
b. Staphylococci
c. Prions
d. Cryptococcus

751. Which of the following hepatitis virus is cultivable?
a. Hepatitis A
b. Hepatitis B
c. Hepatitis D
d. Hepatitis E

752. A 30 years old patient presented with history of jaundice for 10 days. His liver function tests showed bilirubin of 10 mg/dl, SGOT/SGPT - 1100/1450, serum alkaline phosphatase-240 IU. He was positive for HbsAg. What should be the confirmatory test to establish acute hepatitis B infection?
a. IgM Anti-HBc antibody
b. HbeAg
c. HBV DNA by PCR
d. Anti-HBc antibody

739. a	740. b	741. a	742. c	743. a	744. a	745. d	746. a	747. a	748. a
749. a,c	750. c	751. a	752. a						

753. A 30 years old lady delivered a healthy baby at 37 weeks of gestation. She was a known case of chronic hepatitis B infection. She was positive for HBsAg but negative for HBeAg. Which of the following is the most appropriate treatment for the baby?

a. Both active and passive immunization soon after birth
b. Passive immunization soon after birth and active immunization at 1 year of age
c. Only passive immunization soon after birth
d. Only active immunization soon after birth

754. A 30 years man presented with nausea, fever and jaundice of 5 days duration. The biochemical tests revealed a bilirubin of 6.7 mg/dl (conjugated 5.0 mg/dl) with SGOT/SGPT (AST/ALT) of 1230/900 IU/ml. The serological tests showed presence of HBs Ag ,IgM anti-HBc and HBeAg. The most likely diagnosis:

a. Chronic hepatitis B infection with high infectivity
b. Acute hepatitis B infection with high infectivity
c. Chronic hepatitis B infection with low infectivity
d. Acute hepatitis B infection with low infectivity

755. A mother is HBsAg positive at 32 weeks of pregnancy. What should be given to the newborn to prevent neonatal infection:

a. Hepatitis B vaccine + immunoglobulins
b. Immunoglobulins only
c. Hepatitis B vaccine only
d. Immunoglobulins followed by vaccine 1 month later

756. Hepatitis B vaccination is given to a patient. His serum will reveal:

a. HBsAg
b. Anti-HBs Ag
c. IgM Anti-HBc Ag and HBS Ag
d. IgM and IgG Anti-HBc Ag

757. Which of these is not a marker of active replicative phase of chronic hepatitis B?

a. HBVDNA
b. HBV DNA polymerase
c. Anti-HBc
d. AST and ALT

758. About hepatitis B, false statement is:

a. Vertical transmission is more important than horizontal
b. Communicable period lasts for months
c. Virus can be found in blood 1 month before jaundice
d. Age of onset determines the prognosis

759. Chronic liver disease is caused by:

a. Hepatitis B b. Hepatitis A
c. Hepatitis C d. Hepatitis E

760. Hepatitis C virus is a:

a. Toga virus
b. Flavivirus
c. Filovirus
d. Retrovirus

761. A young pregnant woman presents with fulminant hepatic failure. The most likely etiological agent is:

a. Hepatitis B virus
b. Hepatitis C virus
c. Hepatitis E virus
d. Hepatitis A virus

762. Which of the following acute viral hepatitis infections has the highest risk of progression to chronicity?

a. Hepatitis C
b. Hepatitis B
c. Hepatitis A
d. Hepatitis E

763. Hepatitis A is transmitted by:

a. blood route
b. Inhalation
c. Feco-oral route
d. All

753. a	754. b	755. a	756. b	757. c	758. a	759. c	760. b	761. c	762. a
763. c									

764. Most common route of spread of hepatitis E is:

a. Sex
b. Feco-oral
c. Blood transfusion
d. IV injections

765. Serological markers of infectivity of hepatitis B:

a. HBsAg
b. HBeAg
c. IgM anti-HBc
d. HBcAg

766. Which is DNA virus?

a. Hepatitis A b. Hepatitis B
c. Hepatitis C d. Hepatitis D

767. Which of the following does not go into chronic hepatitis stage:

a. HBV b. HCV
c. HDV d. HEV

768. HBV present in India is:

a. Adw b. Ayw
c. Adr d. Ayr

769. Hepatitis D virus:

a. Transmitted by feco-oral route
b. Is a DNA virus
c. Has independent existence
d. Resembles some plant viruses

770. Which of the following is not matched correctly:

a. Hepatitis D Defective virus
b. Hepatitis C Parenteral transmission
c. Hepatitis B RNA virus
d. Hepatitis E Feco-oral transmission

771. Hepatitis B virus vaccine contain:

a. HBsAg b. HBc
c. HBe d. All of the above

772. Dependent hepatitis virus is:

a. Hep A b. Hep D
c. Hep B d. Hep C

773. Hep B is not secreted in:

a. Saliva b. Semen
c. Stool d. None

774. True about HCV include all except:

a. Highest rate of chronicity among all hepatitis viruses
b. Can be cultured
c. Diagnosed by detection of HCV RNA
d. Transmitted through transfusion of infected food

775. All of the following hepatitis virus can be transmitted through blood except:

a. Hepatitis B b. Hepatitis C
c. Hepatitis D d. Hepatitis E

776. Regarding HBV and HDV,false is:

a. Both can infect simultaneously
b. HDV can cause more serious infection due to super infection
c. HDV cannot infect in absence of HBV
d. HDV is a DNA virus

777. HDV is

a. SS RNA virus
b. SS DNA virus
c. DS RNA virus
d. IDS DNA virus

778. First antibody to appear in hepatitis:

a. IgM anti HBe
b. IgM anti HBc
c. IgG anti HBe
d. IgM anti HBs

779. An HIV patient complains of visual disturbances. Fundal examination shows bilateral retinal exudates and perivascular hemorrhages. Which of the following viruses are most likely to be responsible for this retinitis:

a. Herpes simplex retinitis
b. Human herpes virus
c. Cytomegalovirus
d. EBV

780. HIV virus has:

a. Single stranded DNA
b. Single stranded RNA
c. Double stranded DNA
d. Double stranded RNA

764. b	765. b	766. b	767. d	768. b	769. d	770. c	771. a	772. b	773. c
774. b	775. d	776. d	777. a	778. b	779. c	780. b			

781. Regarding HIV infection, not true is:
a. p24 is used for early diagnosis
b. Lysis of infected CD4 cells is seen
c. Dendritic cells do not support replication
d. Macrophage is a reservoir for the virus

782. A patient with HIV has diarrhea with AFB +ve organism in stool. The most likely organism is:
a. Mycobacterium avium intracellulare
b. Mycobacterium tuberculosis
c. Mycobacterium leprae
d. Mycoplasmas

783. A person with AIDS related complex is most likely suffering from:
a. Opportunistic infection
b. Cancer related to AIDS
c. Generalized lymphadenopathy
d. Herpes zoster

784. A known HIV positive patient is admitted in an isolation ward after an abdominal surgery following an accident. The resident doctor who changed his dressing the next day found it to be soaked in blood. Which of the following would be the right method of choice of discarding the dressing?
a. Pour 1% hypochlorite on the dressing material and send it for incineration in an appropriate bag
b. Pour 5% hypochlorite on the dressing material and send it for incineration in an appropriate bag
c. Put the dressing material directly in an appropriate bag and send for incineration
d. Pour 2% Lysol on the dressing material and send it for incineration in an appropriate bag

785. Tissue of origin of Kaposi's sarcoma is:
a. Lymphoid b. Vascular
c. Neural d. Muscular

786. All of the following methods are used for the diagnosis of HIV infection in a 2-month-old child except:
a. DNAPCR
b. Viral culture
c. HIV ELISA
d. p24 antigen assay

787. HIV infects most commonly:
a. CD4 + helper cells
b. CD8 + cells
c. Macrophage
d. Neutrophil

788. HIV infection is associated with all except:
a. A glandular fever like illness
b. Generalized lymphadenopathy
c. Gonococcal septicemia
d. Sinus disease
e. Pre-senile dementia

789. Persistent diarrheas in AIDS is caused by A/E:
a. Microsporidia
b. Cryptosporidium parvam
c. Cryptococcus
d. Isospora belli
e. Giardia lamblia

790. HIV gene is/are:
a. Gp73 b. p24
c. Gpl20 d. Gp5
e. None

791. Receptor for HIV?
a. CD4 b. CD3
c. CD5 d. CD56

792. HIV virus was discovered in
a. 1976 b. 1983
c. 1996 d. 1988

793. In India, maximum cases of tuberculosis in AIDS patients are due to:
a. M. tuberculosis
b. M. avium intracellular
c. M. scrofulaceum
d. M. akari

781. c	782. a	783. a	784. c	785. b	786. c	787. a	788. d	789. c	790. e
791. a	792. b	793. a							

794. Gag gene encodes for:
a. Reverse transcriptase
b. Core antigen
c. Envelope
d. Gene activation

795. The chances of acquiring HIV infection following needle prick is:
a. 0.3% b. 3-0%
c. 0-30% d. 0.003%

796. The common causative agent in diarrhea in AIDS patient is:
a. Toxoplasma
b. Cryptosporidium
c. Salmonellae
d. Mycobacteria

797. HIV is a which type of virus:
a. Picorna virus
b. Pox V
c. Retrovirus
d. Herpes

798. Following cells are infected by HIV:
a. CD8 + T lymphocytes
b. CD4 + T lymphocytes
c. B cells
d. Macrophages

799. All of them are true about AIDS except:
a. Seen in heterosexual only
b. Caused by retrovirus
c. Candidiasis is also common feature
d. Retrovirus is thermolabile

800. Reverse transcriptase is:
a. DNA polymerase
b. DNA dependent RNA polymerase
c. RNA dependent DNA polymerase
d. None

801. Screening test for AIDS:
a. ELISA
b. PCR
c. Western blot
d. CD-4 count

802. Which of the following is not a HIV gene?
a. Gag b. Pol
c. Env d. Rb

803. P24 antigen disappears from the blood after how many weeks infection of HIV:
a. 2-4 weeks
b. 4-6 weeks
c. 6-8 weeks
d. 8-10 weeks

804. All of the following viral genes associated with HIV infection code for structural proteins except
a. Gag gene b. Env gene
c. Pol gene d. Tat gene

805. A HIV mother delivers a baby. All are true except:
a. Risk of HIV in the baby is up to 90%
b. HIV infection cannot be diagnosed in the baby with available methods
c. AIDS can be transmitted from mother to child during delivery
d. Breastfeeding can transmit AIDS

806. Which bacterial infection is not common in HIV patients?
a. Cryptosporidiosis
b. Atypical mycobacterial infection
c. Aspergillosis
d. Candidiasis

807. In HIV patient hemiparesis, headache, vomiting occurs due to infection of which organism:
a. Gonococcus
b. Streptococcus
c. Toxoplasmosis
d. None

808. Co-receptor for R5 variant of HIV virus:
a. Integrin b. CCR 5
c. CXCR4 d. P53

809. Nef gene in HIV is for use:
a. Enhancing the expression of genes
b. Enhancing viral replication
c. Decreasing viral replication
d. Maturation

794. b	795. a	796. b	797. c	798. b	799. a	800. c	801. a	802. d	803. c
804. d	805. a	806. c	807. c	808. b	809. b				

581. B. Culex mosquito

- Ades is vector for Dengue, Yellow fever and Chikungunya
- Anopheles is vector for Plasmodium infections

582. D. Increases mortality in pregnancy

- HEV is a major cause of hepatitis transmitted by the fecal–oral route. It is thought tobe more common than HAV in many developing countries.
- It is a common cause of waterborne epidemics of hepatitis in Asia, Africa, India, and Mexico but isuncommon in the United States.
- HEV is a nonenveloped, single-stranded RNA virusclassified as a member of the hepevirus family.
- Clinically the disease resembleshepatitis A, with the exception of a high mortality rate in pregnant women.
- Chronicliver disease does not occur, and there is no prolonged carrier state.

583. D. EBV

- Epstein–Barr virus infection is associated with nasopharyngeal carcinoma endemic in Asia and is common in malesof Chinese origin.
- EBV DNA can be demonstrated in thenasopharyngeal carcinoma cells.
- Epstein–Barr virus is also associated with Hodgkin's lymphoma and most non-Hodgkin's lymphoma. EBV genome is demonstrated in Reed Sternberg cells in Hodgkin'slymphoma

584. B. Negri bodies

- The rabies viral genome encodes for production of five proteins associated with either the ribonucleoprotein (RNP) complex or theviral envelope.
- The L (transcriptase), N (nucleoprotein), and NS (transcriptase-associated) proteins comprise the RNP complex,together with the viral RNA.
- These proteins are aggregated together in the cytoplasm of virus-infected neurons and constitute Negri bodies, the characteristic histopathological findingof rabies virus infection.

585. D. Chikungunya is transmitted by Aedes

- Refer Q. no 581
- KFD first identified in Karnataka
- Dengue has 4 major serotypes
- Yellow fever not reported in India

586. A. Kyasanur forest disease

- KFD virus was identified frommonkeysin the Kyasanur Forest, Shimoga district, Karnataka.
- Hard ticks are the vectors(Haemaphysalisspinigera)
- Monkeys are the amplifier hosts

587. A. Hepatitis B

- Hepatitis B vaccine is a recombinant vaccine.
- HBsAg is used as vaccine candidate.
- Cloning the S gene into the *yeast* genome.

588. B. Hepatitis Bvirus

- All the hepatitis viruses are RNA viruses except Hepatitis B virus.
- HBV possesses partially double stranded DNA

589. B. RSV

- RSV is the MCC of bronchiolitis in infants.
- Paramyxovirus -ssRNA
- DOC is Ribavirin
- No vaccine available

590. C. Rota virus

- Genetic reassortment commonly seen with viruses possessing segmented RNA.
- Example : Influenza virus, Rota virus, Bunya and Arena viruses.

591. B. Single stage lesions are found at a time

- After an incubation period of 14 to 21 days, brief prodromal symptoms of fever and malaise occur. A papulovesicular rash then appears in crops on the trunk andspreads to the head and extremities.
- At a point of time, the rash appears as papules,vesicles, pustules, and, finally, crusts. Pleomorphic rash is characteristic.

Especially when vesicles are present

592. D. Polio virus

- The chlorination of drinking water is useful for killing most of the common viruses with exception of hepatitisA and polioviruses.
- These two viruses are relatively resistant tochlorination.

593. A. Herpes simplex & D. Chickenpox

- Tzanck smear preparation by Giemsa stain
- Detects multinucleated giantcells with multifaceted nuclei.
- It cannot differentiates between HSV-1, HSV-2, and VZV

594. A. Chicken pox

- Inclusion bodies are not diagnostic for chicken pox. They cannot differentiate HSV1,2 and VZV.
- Rabies – Negri bodies
- MC – Henderson Peterson bodies
- Trachoma – Halberstaedter-Prowazek bodies.

595. C. Measles

- Clinical Cases are the only source of infection. There is no carrier stage and subclinical infection.
- Humans are the only reservoir of infection

596. D. Herpes simplex type II

- HSV 2 causes Genital herpes, which is characterized by painful vesicular lesions of the male andfemale genitals and anal area
- Neonatal herpes originates chiefly from contact with vesicular lesions within the birth canal. In some cases, although there are no visible lesions, HSV-2 is shedinto the birth canal (asymptomatic shedding) and can infect the child during birth.

597. C. Infectious mononucleosis

- Paul–Bunnell test was first described b Paul and Bunnell for demonstration of heterophile antibodiesin patients with infectious mononucleosis in 1932.
- This heterophile antibody, which is an IgM antibody, is not directed against EBV or EBV-infected cells, but is produced due topolyclonal activation of B cells by EBV.
- Such heterophilic antibodies are also found in serum sickness during drug reaction and naturally occurring antibodies to the Forssmanantigen.

598. A. Viruses

- Most sore throats are caused by colds, the flu, coxsackie virus or mono (mononucleosis).
- Bacteria that can cause pharyngitis in some cases: Strep throat is caused by group A streptococcus.
- Less commonly, bacterial diseases such as gonorrhea and chlamydia can cause sore throat.

599. D. Aedes

- The Asian tiger mosquito or forest day mosquito Aedes albopictus is characterized by its black and white striped legs, and small black and white body.

600. D. Mumps

- Clinical features of mumps includes Inapparent infection, Bilateral parotitis, Epididymo-Orchitis, Aseptic meningitis and Pancreatitis.

601. B. Rotavirus

- Rotavirus is a common cause of viral gastroenteritis, especially in young children.
- It is characterized by nausea, vomiting, and watery, nonbloody diarrhea. Gastroenteritis is most serious in young children, in whom dehydrationand electrolyte imbalance are a major concern. Adults usually have minor symptoms.

602. B. Presence of IgM Anti-Hbc in serum

- IgM Anti-Hbc is the earliest diagnostic marker to be elevated following infection.
- HBs Ag is present in carriers also.

603. C. Erythroid cells

- B19 virus infects primarily two types of cells: red blood cell precursors (erythroblasts) in the bone marrow, which accounts for the aplastic anemia, and endothelial cells in the blood vessels, which accounts, in part, for the rashassociated with erythema infectiosum.

604. C. It can be reactivated by emotional disturbances or prolonged exposure to sunlight

- The factors involved in the reactivation of HSV are environmental triggers such as emotional stress, fever, UV exposure, hormonal changes, dental surgery, and cranial trauma.

605. C. Central nervous system

- An ECHO (enteric cytopathic human orphan) virus is a type of RNA virus that belongs to the species Enterovirus B, genus Enterovirus of the Picornaviridae family.
- Echoviruses are found in the gastrointestinal tract (hence it being part of the enterovirus genus) and exposure to the virus causes other opportunistic infections and diseases, notably aseptic meningitis.

606. C. Is preventable by immunization

- Prevented by vaccine prepared from Jeryl Lynn strain.
- Belongs to Paramyxovirus
- Local manifestation.
- Human is the reservoir.

607. C. Parainfluenza virus

- Parainfluenza virus cause croup (acute laryngotracheobronchitis), laryngitis, bronchiolitis,and pneumonia in children and a disease resembling the common cold in adults

608. C. Herpes simplex virus 1

- Encephalitis caused by HSV-1 is characterized by a necrotic lesion in one temporal lobe. Fever, headache, vomiting, seizures, and altered mental status aretypical clinical features.
- The onset may be acute or protracted over several days.
- The disease occurs as a result of either a primary infection or a recurrence.

609. A. Aplastic crisis

- Children with chronic anemia, such as sickle cell anemia, thalassemia, and spherocytosis, can have transient but severe aplastic anemia (aplastic crisis) wheninfected with B19 virus.
- People with normal red blood cells do not have clinically apparent anemia, although their red blood cell precursors are infected.

610. A. It can be transmitted across the placental barrier

- CMV causes cytomegalic inclusion disease (especially congenital abnormalities) inneonates.
- It is the most common cause of congenital abnormalities in developed countries.
- Mostly asymptomatic
- Treatment : Gancyclovir

611. A. Fifth disease

- Fifth disease is associated with Parvo virus B 19

612. B. HPV-6 and HPV-18 are mainly sexually transmitted

- Papillomas of various organs are the predominant finding. These papillomas are caused by specific HPV types.

- For example, skin and plantar warts are caused primarily by HPV-1 through HPV-4, whereas genital warts (condylomatafficacy) are caused primarily by HPV-6 and HPV- 11. HPV-6 and HPV-11 also cause respiratory tract papillomas, especially laryngeal-papillomas, in young children

613. C. Vaccination offers lifelong protection

- Killed vaccine prepared in allantoic cavity of egg which contains HA antigen (15 µg/dose).
- Two doses, given by IM route, ffica-cy 70–90%, lasts for 6–12 months or Single dose is administered by IM or SC route. Protectivity is about 50–80%, Immunity lasts for 6–12 months.

614. C. May be prevented by vaccination

- Refer Q. no 589

615. D. Anti-HBc IgM

- Anti-HBc IgM and HBsAg present in Acute hepatitis.
- Anti-HBc IgM and Anti HBe present in Window period.

616. B. No vaccine available for Hepatitis E

- The one currently licensed hepatitis E vaccine (HEV 239 vaccine) is considered a promising vaccine which has shown a high degree of efficacy against hepatitis E disease in 16–65 year-old healthy subjects in China.

617. B. Human herpesvirus 6

- HHV-6 targets T-cells by binding to CD46 receptor.
- Sixth disease also called as exanthema subitum or roseola infantum.

618. B. HBsAb

- Presence of HBsAb alone indicates vaccination

619. B. Rotaviruses

- Refer Q. no : 601

620. D. All of the above

- Neurotrophic viruses are HSV-1, HSV-2, VZV, JCV, Rabies, HIV, Enterovirus, JE virus..etc

621. A. Varicella zoster immunoglobulin

- Indication for Varicella zoster immu-noglobulin(VZIG)
- Should be given within 72 - 96 hrs of exposure.
- Neonates born to varicella infected mothers - if the onset is between < 5 days before delivery till 48 hrs af-terdelivery.
- VZIG not indicated if the mother has zoster.

622. A. 2 hours of exposure

- Ideal time start PEP for HIV is 2 hours to 72 hours after exposure.

623. C. HIV ELISA

- Antibody detection is useful after 18 months of age.
- Presence of maternal antibody will interfere the results

624. A. Prevent vertical transmission.

- Mother-to-child transmission of HIV is the spread of HIV from a woman with HIV to her child during pregnancy, childbirth (also called labor and delivery), or breastfeeding (through breast milk).
- Pregnant women with HIV receive HIV medicines during pregnancy and childbirth to prevent mother-to-child transmission of HIV. In some situations, a woman with HIV may have a scheduled cesarean delivery (sometimes called a C-section) to prevent mother-to-child transmission of HIV during delivery.
- Women who take HIV medicines during pregnancy and childbirth and whose babies receive HIV medicines for 4 to 6 weeks after birth have a low risk of transmitting HIV.

625. B. Anti HBsAg

- Refer Q. No 618

626. A. Hepatitis B vaccine + immuno-globulins

- HBIG + HBV vaccine is recommended for neonates born to HBV infected mother, where a single injection of

0.5 ml of HBIG is given to the neonate immediately after the birth, followed by full course of vaccine given at a different site.

- First dose should be given within 12 hours of birth

627. A. NS 1 Antigen detection

- The diagnosis can be made in the laboratory either by isolation of the virus in cell culture (1-3 days) or by serologic tests (NS1 antigen -1-5 days)or demonstration of the presence IgM antibody (5-10 days)
- A PCR assaythat detects virus in the blood is also available

628. C. Immunofluoresence

- Other methods are Cytopathic effect (CPE), Viral Interference, Viral antigens demonstration by Direct IF assay, Immunoperoxidase,Electron microscopy & PCR

629. B. Allantoic cavity

- Allantoic cavity is Used for vaccine preparation for Influenza, Yellow fever and Rabies

630. D. Anti-HAV antibody testing has no role in determining vaccination.

- Two types of HAV vaccines available.
- Killed vaccine - Formaldehyde inactivated vaccine (IM)
- Live attenuated vaccine
- Both vaccinesare producing long lasting immunity.

631. C. It can be reactivated by emotional disturbances or prolonged exposure to sunlight

- Refer Q. No 604

632. B. Parvovirus B19

- Parvovirus B19 causes erythema infectiosum (slapped cheek syndrome, fifth disease), aplastic anemia (especially in patients with sickle cell anemia), and fetal infections, including hydrops fetalis.

633. D. Oropharyngeal Ca

Diseases associated with EBV are infectious mononucleosis, Burkitt's lymphoma, other B-cell lymphomas, nasopharyngeal carcinoma, oral hairyleukoplakia and Progressive lymphoproliferative disease.

634. D. IgG detection by ELISA is used for diagnosis

- CMV diagnosis includes Fluorescent antibody and histologic staining of inclusion bodies in giant cells in urine and in tissue.
- The inclusion bodies are intranuclear and have an oval owl's eye shape.
- A fourfold or greater rise in antibody titer is also diagnostic.
- PCR-based assays for CMV DNA or RNA in tissue or body fluids, such as spinal fluid and amniotic fluid, are also very useful.
- PP65 antigen detection is also useful and specific.

635. D. Kaposi's sarcoma is associated

- Kaposi sarcoma – an AIDS defining illness is associated with HHV8

636. D. Rounding & aggregation of cells (grape like clusters) with basophilic, I/N IB Cowdry type A

- Adenoviruses produces grape like clusters as a Cytopathic effect.
- It is intra nuclear Cowdry type B and not A.

637. D. Do not spread by direct contact

- The lesion of molluscum contagiosum is a small (2–5 mm), flesh-colored papule on the skin or mucous membrane that is painless, nonpruritic, and not inflamed.
- The lesions have a characteristic cup-shaped (umbilicated) crater with a white core.
- MCV is transmitted by close personal contact, including sexually. The disease is quite common in children, in whom lesions often occur around the eyes and on the trunk.

638. B. Cervical Cancer is caused by Papilloma virus type 6, 11

- Human cervical cancer – HPV type 16,18,31,33Papillom

- as of various organs are the predominant finding. These papillomas are caused by specific HPV types.
- Skin and plantar warts are caused primarily by HPV-1 through HPV-4, whereas genital warts (condylomata-acuminata) are caused primarily by HPV-6 and HPV-11. HPV-6 and HPV-11 also cause respiratory tract papillomas, especially laryngeal papillomas, in young children.
- Carcinoma of the uterine cervix, the penis, and the anus, as well as premalignantlesions called intraepithelial neoplasia, are associated with infection by HPV-16 and HPV-

639. C. IgG anti HBc

- The diagnosis of HDV infection in the laboratory is made by detecting either delta antigen or IgM antibody to delta antigen in the patient's serum.
- Super infection is followed by HBV infection. It is diagnosed by detection of IgG anti HBcAg.

640. C. HeLa cell line

- HeLa cell line is continues cell line obtained from Cervical Cancer cells.
- Continues cell lines are not suitable for vaccine production

641. D. Ganciclovir

- It's a case of CMV retinitis.
- Ganciclovir is moderately effective in the treatment of CMV retinitis and pneumonia in patients with AIDS.
- Valganciclovir, which can be taken orally, is also effective against CMV retinitis.
- CMV strains resistant to ganciclovir and valganciclovir have emerged, mostly due to mutations in the d gene that encodes the phosphokinase. Drug susceptibility testing can be done.

642. E. It is due to immunity selection to the group of the viruses existing in the community

- Results in periodic epidemic and sporadic cases.
- Occurs in all types
- Mild due to point mutation.
- Periodical - every 2–3 years

643. C. Kyasanur forest disease (KFD) is transmitted by ticks

- Yellow fever not reported from India
- Dengue has 4 common serotypes
- Dengue and JE transmitted by Ades mosquito

644. B. Acute hepatitis B infection with high infectivity

	HBsAg	HBsAg	Anti-HBS	Anti-HBe	Anti-HBc	
					IgM	IgG
Late incubation period or early hepatitis	+	+	–	–	–	–
Acute hepatitis	+	+	–	–	+	–
Late/chronic HBC infection	+	+*	–	–	–	+
Simple carrier	+	–	–	–	–	+
Super carrier	+	+	–	–	–	+
Past infection	–	–	+	+	–	+
Immunity following vaccination	–	–	+	–	–	–

*When +, it indicates high infectivity while – indicates low infectivity.

645. B. Japanese B encephalitis.

- Two types of JE transmission cycle are
- Pigs to Culex to Pigs
- Ardeid birds to Culex to Ardeid birds

646. D. Poxvirus

- Refer Q no 637

647. C. NK cells

- HIV affects T helper cells (Mainly), Macrophages, B lymphocytes and Follicular dendritic cells

648. C. Nipah virus&d. West Nile virus

- During the past 20 years there has been a dramatic resurgence or emergence of epidemic arboviral diseases affecting both humans and domestic animals.
- These epidemics have been caused primarily by viruses thought to be under control such as dengue, Japanese encephalitis, yellow fever, and Venezuelan equine encephalitis, or viruses that have expanded their geographic distribution such as West Nile and Rift Valley fever.

649. B. H7N7

- H7N7 – Netherlands
- H9N2 -Hong Kong
- H7N9 - China

650. C. Bat

- Hendra virus is a new paramyxovirus first isolated from the cases of severe respiratory disease in Hendra, Australia, in 1994; hence the nameHendra virus.
- Infection is transmitted from infected horses tohumans.
- Fruit bats are the natural reservoir.
- No specific antiviral agent or vaccine is available.

651. A. Chick embryo cell culture

- Human carcinoma of cervix cell line (HeLa)
- Human epithelioma of larynx cell line (Hep-2)
- Human carcinoma of nasopharynx cell line (KB)
- Human synovial carcinoma cell line (McCoy)

652. A. Adenovirus

- Human fetal lung fibroblast cell line used for the cultivation and preparation of adenovirus vaccine.

653. B. HSV-II

- Neonatal herpes originates chiefly from contact with vesicular lesions withinthe birth canal.
- In some cases, although there are no visible lesions, HSV-2 is shedinto the birth canal (asymptomatic shedding) and can infect the child during birth.
- Neonatal herpes varies from severe disease (e.g., disseminated lesions orencephalitis) to milder local lesions (skin, eye, mouth) to asymptomatic infection.
- Encephalitis is a common component of this category of infection, occurring in about 60 to 75% of infants with disseminated disease.
- While the presence of a vesicular rash can greatly facilitate the diagnosis of HSV infection, over 20% of neonates with disseminated HSV disease do not develop cutaneous vesicles during the course of their illness.

654. B. Herpes simplex encephalitis

- Encephalitis caused by HSV-1 is characterized by a necrotic lesion in onetemporal lobe.
- Fever, headache, vomiting, seizures, and altered mental status aretypical clinical features. The onset may be acute or protracted over several days.
- The disease occurs as a result of either a primary infection or a recurrence.
- Magnetic resonance imaging often reveals the lesion. Examination of the spinal fluid typically shows a moderate increase of lymphocytes, a moderate elevation in theamount of protein, and a normal amount of glucose.
- HSV-1 encephalitis has a highmortality rate and causes severe neurologic sequelae in those who survive.

655. B. 6 days after onset of rash

- Infectivity period of chicken pox is 2 days before the onset of rash to 5 -6 days after thereafter, until thevesicles are crusted.

656. B. Cytomegalovirus

- CMV is the MC transplant transmitted viral infection in transplantrecipients especially solid organ transplant (Kidney) recipients.
- It occurs usually less than 6 months following transplantation.
- Presentation is Bilateral interstitial pneumonia.

657. A. CMV

- Refer Q. No 656

658. A. Cytomegalovirus, B.Polyoma virus & D. HIV

- Epstein-Barr virus, cytomegalovirus, adenovirus and polyomavirus (type BK) are prominent members of this group causing specific diseases.
- Other viruses lack direct histological evidence of viral replication in the kidney, such as hepatitis C or human immunodeficiency virus (HIV).
- They are associated with renal disorders in immunocompetent and/or immunocompromised hosts, and glomerular or tubulo-interstitial injury can be caused via indirect pathways, such as the deposition of immune complexes or cryoglobulins.

659. B. Varicella zoster

- Tzanck smear preparation by Giemsa stain
- Detects multinucleated giantcells with multifaceted nuclei.
- It cannot differentiates between HSV-1, HSV-2, and VZV
- Poor Sensitivity

660. A. Varicella

- Maximum risk seen in mother acquires a primary infection(Chicken pox) during pregnancy.
- Infection acquired in late first or early second trimester leads to severe congenital malformation in fetus including cicatricial skin lesions, limb hypoplasia and microcephaly.

661. C. Adenovirus

- In the upper respiratory tract, adenoviruses cause such infections as pharyngitis, pharyngoconjunctival fever, and acute respiratory disease, characterized by fever,sore throat, coryza (runny nose), and conjunctivitis.
- In the lower respiratory tract, they cause bronchitis and atypical pneumonia.
- Hematuria and dysuria are prominentin hemorrhagic cystitis.
- Gastroenteritis with nonbloody diarrhea occurs mainly inchildren younger than 2 years of age.
- Most adenovirus infections resolvespontaneously. Approximately half of all adenovirus infections are asymptomatic

662. B. Vaccinia & C. Adenovirus

- Retrovirus
- Lentivirus
- Vaccinia virus
- Adenovirus
- Adeno-associated virus
- Cytomegalovirus

663. D. Transplacental transfer occurs in only 10% of cases

- B19 virus is transmitted primarily by the respiratory route; transplacentaltransmission also occurs (30%).
- Blood donated for transfusions also can transmit the virus.
- Humans are the naturalreservoir; animals are not a source of human infection.

664. A. Monospot test

- Comparing with Paul bunnel test, Most sensitive test is more sensitive and specific.
- Differential absorption and Monospot tests are used for the confirmation.

665. B. Nasopharyngeal Ca

- EBV infection is associated with several cancers, namely Burkitt's lymphoma,some forms of Hodgkin's lymphoma, and nasopharyngeal carcinoma.
- The word associated refers to the observation that EBV infection is the initiating event thatcauses the cells to divide, but that event itself does not cause a malignancy.

666. A. HSV-I causes encephalitis

- EBV affects B cells
- CMV asymptomatic and symptomatic
- Reactivation of varicella is herpes zoster.

667. B. VZV

- Varicella Zoster virus exhibits latency.
- Zoster is due to reactivation of latent VZV
- Presence of rashesin single dermatome
- Ramsay Hunt syndrome - facial nerve paralysis with vesicle on tympanic
- Membrane, tongue and external auditory meatus.

668. A. Herpes- zoster

- Herpes Zoster Ophthalmicus (HZO) is an ocular disease which usually manifests as a unilateral painful skin rash in a dermatomal distribution of the trigeminal nerve shared by the eye and ocular adnexa.
- HZO occurs typically in older adults but can present at any age and occurs after reactivation of latent varicella-zoster virus (VZV) present within the sensory spinal or cerebral ganglia.

669. C. Diagnosed by increased IgA in fetal blood

- IgM antibodies are indicative of active infection.
- PCR from amniotic fluid is diagnostic.

670. A. Human parvovirus B-19

- Refer Q. No 632

671. B. Adenovirus

- DNA viruses are Pox, Herpes, HBV, Adeno, Parvo and Papova viruses.

672. A. CNS

- Most common extracutaneous complication is CNS involvement mainly cerebellar ataxia, encephalitis andaseptic meningitis followed by varicella pneumonia (fatal)

673. A. Ebsteinbarr virus

- Refer Q. No 633

674. A. Double stranded DNA

- Adenovirus is space ship appearance
- Non enveloped, dsDNA and Icosahedral symmetry.

675. B. EB virus

- Refer Q. no 632

676. D. Burkitt's lymphoma involves T-cells

- EBV targets CD21/CR2 receptors of B cells.

677. D. Herpes virus

- VZV classified under alpha group of Herpes viridiae.
- Recent nomenclature is HHV3

678. B. dsDNA

- All the DNA viruses are ds DNA viruses except Parvo virus - ssDNA

679. A. Nasopharyngeal Ca

- Refer Q. no 632

680. A. Macrocephaly

- VZV - Congenital malformation in fetus including cicatricial skin lesions, limb hypoplasia and microcephaly.

681. D. Molluscum

- Molluscum contagiosum is non cultivable virus.
- It cannot be propagated in tissue culture, egg or in animals.

682. C. Kaposi's sarcoma

- Kaposi sarcoma – an AIDS defining illness is associated with HHV8

683. A. Parvovirus B19

- Refer Q. no 632

684. A. Adenovirus 3 and 7

- Hemorrhagic cystis – Adenovirus type 11 & 21
- Infantile diarrhea- Adeno 40, 41
- STD- Adenovirus type 37
- Epidemic conjuntivitis – Adenovirus type 8, 19, 37 (shipyard eye)
- Swimming pool conjunctivitis- Adenovirus type 3, 7, 14

- Pharyngitis & Pneumonia- Adenovirus type 3 & 7

685. B. Small pox

- Rabies –Bullet
- Small Pox virus- Brick
- Ebola virus- Filamentous
- Tobaco mosaic virus– Rod
- Space vehicle – Adenovirus

686. C. There is a single serotype causing infection

- Polio virus - There are three serologic (antigenic) types based on different antigenic determinants on the outer capsid proteins.
- Because there is little cross-reaction, protection from disease requires the presence of antibody against each of the three types.

687. D. Hemorrhagic fever

- Enteroviruses transmitted by fecal-oral route.
- They do not cause intestinal symptoms, but are associated with systemic manifestations like herpangina, pleurodynia, Myocarditis, Aseptic meningitis and poliomyelitis.

688. B. Inactivated vaccine given I/M

- Three serotypes
- Most cases are asymptomatic / inapparent

689. A. Hemorrhagic fever

- Refer Q. no 687

690. A. Bird flu virus

- H1N1 - Swine flu
- H5NI - Avian flu
- H3N2 – Seasonal flu

691. A. Influenza virus

Segmented RNA is present in:
B-unyaviruses
O-rthomyxoviruses (Influenza virus)
R-eoviruses (Rotavirus)
A-denovirus

692. A. Orchitis and Oophoritis

- Epididymo-orchitis is a manifestation of mumps, developing in 15–30% of cases in postpubertal males, with bilateral involvement in 10–30% of those cases.
- Orchitis, accompanied by fever, typically occurs during the first week of parotitis but can develop up to 6 weeks after parotitis or in its absence.
- The testis is painful and tender and can be enlarged to several times its normal size; this condition usually resolves within 1 week.
- Testicular atrophy develops in one-half of affected men.
- Sterility after mumps is rare, although subfertility is estimated to occur in 13% of cases of unilateral orchitis and in 30–87% of cases of bilateral orchitis.
- Oophoritis occurs in ~5% of women with mumps and may be associated with lower abdominal pain and vomiting but has only rarely been associated with sterility or premature menopause.

693. B. Mumps causes aseptic meningitis in children

Documented CSF pleocytosis indicates that mumps virus invades the CNS in ~50% of cases; however, symptomatic CNS disease, typically in the form of aseptic meningitis, occurs in <10% of cases, with a male predominance.

CNS symptoms of aseptic meningitis (e.g., stiff neck, headache, and drowsiness) appear ~5 days after parotitis and also occur often in the absence of parotid involvement.

694. A. Rotavirus

A previously approved vaccine for Rotavirus (Rotashield) was withdrawn when a high rate of intussusception occurred in vaccine recipients.

695. C. Rotavirus

Rotavirus has segmented RNA and therefore can undergo genetic reassortment.

696. B. Rabies

Egg-derived vaccines: Allantoic cavity of embryonated eggs is the best site for the preparation of rabies vaccine.

697. B. Licks on a fresh wound

Risk categorization and recommended anti-rabies prophylaxis

Category of risk	Type of exposure	Recommended prophylaxis (WHO**)
Category I (No risk)	• Touching, or feeding of animal • Licks on intact skin	• No treatment needed if history is reliable
Category II (Minor risk)	Minor scratches or abrasions without bleeding or nibbling of uncovered skin	• Wound management • Rabies vaccine • Observe the dog for 10 days
Category III (Major risk)	• Single or multiple transdermal bites with oozing of blood • Licks on broken skin (fresh wounds) or mucous membrane • Bite by wild animals/bat	• Wound management • Rabies immunoglobulin • Rabies vaccine • Observe the dog for 10 days*

*Vaccine may be discontinued if animal (dogs and cats) is healthy after 10 days of bite. Other animals are humanly killed and tissue is examined for detection of rabies antigen/ Negri body in brain biopsies.

**In India post exposure prophylaxis is indicated following exposure to any animal bite except rats.

698. B. skin impression smear for immuno-fluorescence stain

- Direct immunofluorescence test (direct-IF) can be performed to detect rabies nucleoprotein antigens in specimens by using specific monoclonal antibodies tagged with fluorescent dye.
- The best specimen is hair follicle of nape of neck (most sensitive).
- Corneal impression smear can also be used. It is usually positive in late stage with a sensitivity of 30%.

699. B. Withhold immunization and observe the dog for 10 days for signs of rabies

700. B. Negri bodies

The most characteristic pathologic finding in rabies is the *Negri body*.

Negri bodies are eosinophilic cytoplasmic inclusions in brain neurons that are composed of rabies virus proteins and viral RNA.

These inclusions occur in a minority of infected neurons, are commonly observed in Purkinje cells of the cerebellum and in pyramidal neurons of the hippocampus, and are less frequently seen in cortical and brainstem neurons. Negri bodies are not observed in all cases of rabies.

701. A. Relapsing fever

- Borrelia recurrentis, Borrelia hermsii, and several other borreliae cause relapsing fever.
- During infection, the antigens of these organisms undergo variation.
- As antibodies develop against one antigen, variants emerge and produce relapses of the illness.
- This can be repeated 3 to 10 times.
- B. recurrentis is transmitted from person to person by the human body louse.
- Humans are the only hosts.
- B. hermsii and many other Borrelia species are transmitted to humans by soft ticks (Ornithodoros). Rodents and other small animals are the main reservoirs.
- These species of Borrelia are passed transovarially in the ticks, a phenomenon that plays an important role in maintaining the organism in nature.

702. C. KFD is transmitted by ticks

KFD is transmitted by hard tick Haemophysalis spinifera.

703. A. Hanta virus pulmonary syndrome is caused by inhalation of rodent urine and feces

In 1993, an outbreak of a new disease, characterized by influenzalike symptoms followed rapidly by acute respiratory failure, occurred in the western United States, centered in New Mexico and Arizona.

This disease, now called hantavirus pulmonary syndrome, is caused by a hantavirus (Sin Nombre virus) endemic in deer mice (*Peromyscus*) and is acquired by inhalation of aerosols of the rodent's urine and feces.

It is not transmitted from person to person.

Very few people have antibody to the virus, indicating that asymptomatic infections are not common.

704. A. IgM Capture ELISA

MAC-ELISA is the most recommended tool available currently for dengue infection. It has a sensitivity and specificity of approximately 90% and 98% respectively.

705. A. Caused by 5 serotypes
D. Virus belongs to Flavivirus genus

Dengue virus is the most common arbovirus found in India. It has four serotypes (DEN-1, to DEN-4). Recently, the fifth serotype (DEN-5) was discovered in 2013 from Bangkok.

706. D. Infection after 16 weeks of gestation result in major congenital defects

Infection during first trimester, specially first month(when organogenesis occurs) leads to congenital malformations.

707. D. Detection of viral hemagglutination inhibiting (HAI) antibodies in a single serum specimen

A four-fold increase in antibody titre in acute and convalescent sera is more informative.

708. C. Respiratory syncytial virus

- Respiratory syncytial virus (RSV) is the most important cause of pneumonia and bronchiolitis in infants.
- It is also an important cause of otitis media in children and of pneumonia in the elderly and in patients with chronic cardiopulmonary diseases.

709. C. Measles - Edmonston - Zagreb strain & D. BCG-Danish 1331 strain

- More than ten live attenuated mumps vaccine strains (Jeryl Lynn, Urabe, Hoshino, Leningrad-3, L-Zagreb, Miyahara, Torii, NK M-46, S-12 and RIT 4385) have been used throughout the world.
- The Jeryl Lynn strain is used in many countries.
- Most vaccines contain 25 μg of neomycin per dose.
- Several manufacturers in Japan and Europe produce a mumps vaccine containing the Urabe Am9 virus strain.
- However, concerns about vaccine-associated meningitis prompted several countries to stop using Urabe vaccine strain (WER 1992).
- Other vaccines have more limited distribution. In most cases, the viruses are cultured in chick embryo fibroblasts (such as for the Jeryl Lynn and Urabe strain-containing vaccines); however, quail and human embryo fibroblasts are also used for some vaccines.
- Most live attenuated rubella vaccines used throughout the world contain the RA 27/3 virus strain (Plotkin, 1965).
- Exceptions are vaccines produced in China (BRD2 virus strain) and Japan (Matsuba, Takahashi, and TO- 336), produced on rabbit kidney cells, and the Matsuura strain, produced on quail embryo fibroblasts.
- The RA 27/3 strain is used most often because of consistent immunogenicity, induction of resistance to reinfection, and low rate of side-effects (Plotkin et al., 1973).

- The live-attenuated virus produces viraemia and pharyngeal excretion, but both are of low magnitude and are non-communicable (Plotkin & Orenstein, 1999).

710. A. RSV, C. Parainfluenza & D. Influenza

711. A. Nipah virus, C. Corona virus & D. SARS

- Nipah virus is a paramyxovirus that causes encephalitis, primarily in the South Asian countries of Bangladesh, Malaysia, and Singapore.
- The natural reservoir appears to be fruit bats.
- People who have contact with pigs are particularly at risk for encephalitis, and some human-to-human transmission occurs.
- In general, paramyxoviruses are transmitted by saliva or sputum and that is the likely mode of transmission.
- There is no treatment, or vaccine for Nipah virus infections.
- Coronaviruses are an important cause of the common cold, probably second only to rhinoviruses in frequency.
- In 2002, a new disease, an atypical pneumonia called severe acute respiratory syndrome (SARS), emerged.
- In 2012, another severe pneumonia called Middle East respiratory syndrome emerged.

712. C. Transmitted by mites

Crimean-congo HF :

- This severe HF syndrome has a wide geographic distribution, potentially being found wherever ticks of the genus Hyalomma occur.
- The propensity of these ticks to feed on domestic livestock and certain wild mammals means that veterinary serosurveys are the most effective mechanism for the surveillance of virus circulation in a region.
- Human infection is acquired via a tick bite or during the crushing of infected ticks.
- Domestic animals do not become ill but do develop viremia; thus, there is danger of infection at the time of slaughter and for a brief interval thereafter (through contact with hides or carcasses).
- Cases have followed sheep shearing.
- An epidemic in South Africa was associated with slaughter of tick-infested ostriches.
- Nosocomial epidemics are common and are usually related to extensive blood exposure or needle sticks.

713. C. Typhoid

Salmonella typhi has no animal reservoir. Infection is acquired from cases or carriers.

714. E. All 4 types

715. A. 3 doses

716. B. Decreased absorption by villi

- Rotaviruses infect and ultimately destroy mature enterocytes in the villous epithelium of the proximal small intestine.
- The loss of absorptive villous epithelium, coupled with the proliferation of secretory crypt cells, results in secretory diarrhea.
- Brush-border enzymes characteristic of differentiated cells are reduced, and this change leads to the accumulation of unmetabolized disaccharides and consequent osmotic diarrhea.
- Studies in mice indicate that a nonstructural rotavirus protein, NSP4, functions as an enterotoxin and contributes to secretory diarrhea by altering epithelial cell function and permeability.
- In addition, rotavirus may evoke fluid secretion through activation of the enteric nervous system in the intestinal wall.
- Recent data indicate that rotavirus antigenemia and viremia are common among children with acute rotavirus infection, although the antigen and RNA levels in serum are substantially lower than those in stool.

717. **D. HDCV**

- In the West, the rabies vaccine contains inactivated virus grown in human diploid cells. (Vaccine grown in monkey lung cells or chick embryo cells is also available.)
- In other countries, the duck embryo vaccine or various nerve tissue vaccines are available as well.
- Duck embryo vaccine has low immunogenicity, and the nerve tissue vaccines can cause an allergic encephalomyelitis as a result of a cross-reaction with human myelin.
- For these reasons, the human diploid cell vaccine (HDCV) is preferred.

718. **C. Dengue**

- After an incubation period of 2–7 days, the typical patient experiences the sudden onset of fever, headache, retroorbital pain, and back pain along with the severe myalgia that gave rise to the colloquial designation "break-bone fever."
- There is often a macular rash on the first day as well as adenopathy, palatal vesicles, and scleral injection.
- The illness may last a week, with additional symptoms usually including anorexia, nausea or vomiting, marked cutaneous hypersensitivity, and—near the time of defervescence—a maculopapular rash beginning on the trunk and spreading to the extremities and the face.
- Epistaxis and scattered petechiae are often noted in uncomplicated dengue, and preexisting gastrointestinal lesions may bleed during the acute illness.

719. **A. RSV**

- Please refer to explanation to question 128.

720. **C. Primary infectious pneumonia is less common than secondary bacteria pneumonia**

- Primary influenza viral pneumonia is the least common but most severe of the pneumonic complications.
- Secondary bacterial pneumonia follows acute influenza.
- Improvement of the patient's condition over 2–3 days is followed by a reappearance of fever along with clinical signs and symptoms of bacterial pneumonia, including cough, production of purulent sputum, and physical and x-ray signs of consolidation.
- The most common bacterial pathogens in this setting are Streptococcus pneumoniae, Staphylococcus aureus, and Haemophilus influenzae—organisms that can colonize the nasopharynx and that cause infection in the wake of changes in bronchopulmonary defenses.

721. **B. Rabies virus**

- Please refer to explanation to question 120.

722. **A. Louis Pasteur**

He had contributed for the vaccine development against several diseases, such as anthrax, fowl cholera and rabies.

723. **B. Reovirus**

- REO is an acronym for respiratory enteric orphan; when the virus was discovered, it was isolated from the respiratory and enteric tracts and was not associated with any disease.
- Rotaviruses are the most important human pathogens in the reovirus family.
- Rotavirus has a segmented, double-stranded RNA genome surrounded by a double-layered icosahedral capsid without an envelope.
- The rotavirus genome has 11 segments.

724. **B. Genetically engineered glycoprotein vaccine**

- Semple vaccine: It is derived from infected sheep brain, inactivated with phenol. Beta propiolactone (BPL) vaccine: It is a modified Semple vaccine which is inactivated with beta propiolactone instead of phenol.

- Infant mouse brain vaccines: It is derived from infected neural tissue of newborn mice.
- Human diploid cell (HDC)vaccine: This is derived from WI-38 (human embryonic lung fibroblast cell line).
- Recombinant viral vaccine: Vaccinia virus carrying the rabies surface glycoprotein gene has been developed. It is given orally, has been successful for immunizing animals, but still in experimental stage for human use.

725. B. Infantile diarrhea

Rotavirus is the most common cause of diarrhea in infants and children.

726. A. Adenovirus

Adenovirus is a DNA virus, hence cannot be diagnosed by Reverse Transcriptase PCR.

727. B. Mumps

- Mumps virus infects the upper respiratory tract and then spreads through the blood to infect the parotid glands, testes, ovaries, pancreas, and, in some cases, meninges.
- Alternatively, the virus may ascend from the buccal mucosa up Stensen's duct to the parotid gland.
- It only multiplies in the respiratory tract and does not cause any respiratory signs and symptoms.

728. A. CMV

- Enterovirus 70 and Coxsackie virus A24 cause acute hemorrhagic conjunctivitis.
- Adenovirus causes epidemic keratoconjunctivitis.

729. A. Rotavirus

- Isolation of rotavirus is difficult.
- Rolling of tissue cultures may be attempted to enhance replication.

730. D. Recombinant glycoprotein

- Please refer to explanation to question 724.

731. D. All

732. B. Fixed virus

Differences between street and fixed rabies viruses

Street viruses	Fixed viruses
Freshly isolated	Isolated after serial intracerebral passage in rabbits/cell lines
Produce Negri body	Do not produce Negri body
Affect salivary glands	Do not affect salivary glands
Pathogenic	Not pathogenic (except-if no inactivated properly)
Incubation Period: 1-3 months (20-90 days)	Incubation Period: 4-6 days
Produce disease	Used for vaccine

733. A. H1N1

The pandemic A/ H1N1 virus of 2009–2010 was a quadruple reassortant among swine influenza viruses that circulated in North America and Eurasia, an avian virus, and a human influenza virus.

The influenza A/H1N1 virus responsible for the most severe pandemic of modern times (1918–1919) appears to have represented an adaptation of an avian virus to efficient infection of humans.

734. A. Picornavirus

- Picornaviruses are small (20–30 nm) nonenveloped viruses composed of an icosahedral nucleocapsid and a single-stranded RNA genome.
- The genome RNA has positive polarity (i.e., on entering the cell, it functions as the viral mRNA).
- There is no polymerase within the virion.
- Picornaviruses replicate in the cytoplasm of cells.
- They are not inactivated by lipid solvents, such as ether, because they do not have an envelope.

735. B. 2

736. C. Result from genetic recombination

Influenza viruses, especially influenza A virus, show changes in the antigenicity

of their hemagglutinin and neuraminidase proteins; this property contributes to their capacity to cause devastating worldwide epidemics (pandemics). There are two types of antigenic changes:

(1) antigenic shift, which is a major change based on the reassortment of segments of the genome RNA; and

(2) antigenic drift, which is a minor change based on mutations in the genome RNA. Note that in reassortment, entire segments of RNA are exchanged, each one of which codes for a single protein (e.g., the hemagglutinin)

737. A. Coxsackie A

- Herpangina is usually caused by coxsackievirus A and presents as acute-onset fever, sore throat, odynophagia, and grayish-white papulovesicular lesions on an erythematous base that ulcerate.
- The lesions can persist for weeks; are present on the soft palate, anterior pillars of the tonsils, and uvula; and are concentrated in the posterior portion of the mouth.
- In contrast to herpes stomatitis, enteroviral herpangina is not associated with gingivitis.
- Acute lymphonodular pharyngitis associated with coxsackievirus A10 presents as white or yellow nodules surrounded by erythema in the posterior oropharynx. The lesions do not ulcerate.

738. C. Ebola virus

- Ebola virus is named for the river in Zaire that was the site of an outbreak of hemorrhagic fever in 1976.
- The disease begins with fever, headache, vomiting, and diarrhea.
- Later, bleeding into the gastrointestinal tract occurs, followed by shock and disseminated intravascular coagulation.
- The hemorrhages are caused by severe thrombocytopenia. The mortality rate associated with this virus approaches 100%.
- Most cases arise by secondary transmission from contact with the patient's blood or secretions (e.g., in hospital staff).
- Reuse of needles and syringes is also implicated in the spread within hospitals.

739. A. Coxsackie Virus

- The classification of Coxsackie viruses into group A or B is based on pathogenicity in suckling mice.
- Group A viruses cause widespread myositis and flaccid paralysis, which is rapidly fatal, whereas group B viruses cause generalized, less severe lesions of the heart, pancreas, and central nervous system and focal myositis.
- At least 24 serotypes of Coxsackie virus A and 6 serotypes of Coxsackie virus B are recognized.

740. B. Bilateral symmetrical

- The least common presentation is that of paralytic disease.
- After one or several days, signs of aseptic meningitis are followed by severe back, neck, and muscle pain and by the rapid or gradual development of motor weakness.
- In some cases the disease appears to be biphasic, with aseptic meningitis followed first by apparent recovery but then (1–2 days later) by the return of fever and the development of paralysis; this form is more common among children than among adults.
- Weakness is generally asymmetric, is proximal more than distal, and may involve the legs (most commonly); the arms; or the abdominal, thoracic, or bulbar muscles.
- Paralysis develops during the febrile phase of the illness and usually does not progress after defervescence.

741. A. Granular

742. C. Retinitis

- The significance of rubella virus is not as a cause of mild childhood disease but as a teratogen.

- When a nonimmune pregnant woman is infected during the first trimester, especially the first month, significant congenital malformations can occur as a result of maternal viremia and fetal infection.
- The increased rate of abnormalities during the early weeks of pregnancy is attributed to the very sensitive organ development that occurs at that time.
- The malformations are widespread and involve primarily the heart (e.g., patent ductus arteriosus), the eyes (e.g., cataracts), and the brain (e.g., deafness and mental retardation).

743. A. Retrovirus

- The acutely transforming oncogenic retroviruses possess viral oncogenes (V.onc).
- The slow transforming oncogenic retroviruses possess additional regulatory gene (e.g.,tax gene for HTLV-1 and tat gene for HIV).
- Oncogenic retroviruses belong to exogenous type; (i.e. spread horizontally between host cells).
- Endogenous retroviruses spread vertically from parent host cells to offspring) and they are mostly non-pathogens.

744. A. Dengue Virus

- Remaining three options infect GIT and are non-enveloped.

745. D. Alzheimer's disease

Important Features of Slow Viral Disease Caused by Prions

Disease	Pathogenesis	Important Features
Kuru	Transmissible/infectious	Caused by ingesting or handling brain tissue; occurred in New Guinea tribes people
Creutzfeldt-Jakob disease	1.Transmissible / infectious 2. Hereditary/genetic 3. Sporadic	Iatrogenic transmission by corneal transplant, brain electrodes, and growth hormone Mutation in germ cells No relationship to any known cause; possible new mutation in somatic cells; most common form
Variant Creutzfeldt-Jakob disease	Transmissible/infectious	Probably acquired by eating meat or nervous tissue from animals with mad cow disease
Gerstmann-Straussler-Scheinker syndrome	Hereditary/genetic	Mutation in germ cells
Fatal familial insomnia	Hereditary/genetic	Mutation in germ cells

- Scrapie is a disease of sheep, characterized by tremors, ataxia, and itching, in which the sheep scrape off their wool against fence posts.
- It has an incubation period of many months.
- Spongiform degeneration without inflammation is seen in the brain tissue of affected animals.
- It has been transmitted to mice and other animals via a brain extract that contained no recognizable virus particles.
- Studies of mice revealed that the infectivity is associated with a 27,000-molecular-weight protein known as a prion.

746. A. Myoclonus is seen in 10% of the patients

- Prions are protein-containing particles with no detectable nucleic acid that are highly resistant to inactivation by heat, formaldehyde, and ultraviolet light at doses that will inactivate viruses.
- The human prion-mediated diseases (e.g., kuru and CJD) are called transmissible spongiform encephalopathies (TSE).
- The term spongiform refers to the spongy, Swiss cheese–like holes seen in the brain parenchyma that are caused by the death of the neurons .
- No virus particles are seen in the brain of people with these diseases.
- The transmissibility of the agent of kuru and CJD ("prions") was initially established by inoculation of material from the brains of infected patients into the brains of primates followed by serial transfer to the brains of other primates.

747. A. Slow virus

Bovine Spongiform Encephalopathy:

- BSE is also known as mad cow disease.
- The cattle become aggressive, ataxic, and eventually die.
- Cattle acquire BSE by eating feed supplemented with organs (e.g., brains) obtained from sheep infected with scrapie prions. (It is also possible that BSE arose in cattle by a mutation in the gene encoding the prion protein.)
- BSE is endemic in Great Britain. Supplementation of feed with sheep organs was banned in Great Britain in 1988 and thousands of cattle were destroyed, two measures that have led to a marked decline in the number of new cases of BSE. BSE has been found in cattle in other European countries such as France, Germany, Italy, and Spain, and there is significant concern in those countries that variant CJD may emerge in humans.
- Two cases of BSE in cattle in the United States have been reported.

748. A. Prion disease

- Fatal familial insomnia is a very rare disease characterized by progressive insomnia, dysautonomia (dysfunction of the autonomic nervous system) resulting in various symptoms, dementia, and death.
- A specific mutation in the prion protein is found in patients with this disease.

749. A. Prion & C. Genetic factors

- CJD is a prion disease.
- Although most cases of CJD are sporadic, about 10% are hereditary.
- The hereditary (familial) form is inherited as an autosomal dominant trait.
- In these patients, 12 different point mutations and several insertion mutations in the prion protein gene have been found.

750. C. Prions

Prions are protein-containing particles with no detectable nucleic acid that are highly resistant to inactivation by heat, formaldehyde, and ultraviolet light at doses that will inactivate viruses.

751. A. Hepatitis A

It is the only hepatitis virus which is cultivable in-vitro.

752. A. IgM Anti-HBc antibody

Serologic Test Results in Four Stages of HBV Infection

Test	Acute Disease	Window Phase	Complete Recovery	Chronic Carrier State
HBsAg	Positive	Negative	Negative	Positive
HBsAb	Negative	Negative	Positive	Negative[1]
HBcAb	Positive[2]	Positive	Positive	Positive

[1]Chronic carriers have negative antibody tests, but HBsAb is being made by these individuals. It is undetected in the tests because it is bound to the large amount of HBsAg present in the plasma. They are not tolerant to HbsAg.
[2]IgM is found in the acute stage; IgG is found in subsequent stages.
Note: People immunized with HBV vaccine have HBsAb but not HBcAb because the immunogen in the vaccine is purified HBsAg.

753. A. Both active and passive immunization soon after birth

- Both the vaccine and HBIG should also be given to a newborn whose mother is HBsAg-positive.
- This regimen is very effective in reducing the infection rate of newborns whose mothers are chronic carriers.
- The regimen of vaccine plus HBIG in those with needle-stick injuries and in neonates is a good example of passive–active immunization, in which both immediate protection and long-term protection are provided.

754. B. Acute hepatitis B infection with high infectivity

- IgM anti HBc indicates acute infection.
- HBeAg arises during the incubation period and is present during the prodrome and early acute disease and in certain chronic carriers.
- Its presence indicates a high likelihood of transmissibility, and, conversely, the finding of HBeAb indicates a lower likelihood, but transmission can still occur.

755. A. Hepatitis B vaccine + immunoglobulins

Please refer to explanation to question 753.

756. B. Anti-HBs Ag

Please refer to explanation to question 752.

757. C. Anti-HBc

Please refer to explanation to question 752.

758. A. Vertical transmission is more important than horizontal

- The three main modes of transmission are via blood, during sexual intercourse, and perinatally from mother to newborn.
- The observation that needle-stick injuries can transmit the virus indicates that only very small amounts of blood are necessary.
- HBV infection is especially prevalent in addicts who use intravenous drugs. Screening of blood for the presence of HBsAg has greatly decreased the number of transfusion-associated cases of hepatitis B.
- However, because blood transfusion is a modern procedure, there must be another, natural route of transmission.
- HBV is found in semen and vaginal fluids, so it is likely that sexual transmission is important.
- Transmission from mother to child during birth is another important natural route.
- Transplacental transmission, if it occurs, is rare.
- There is no evidence that transmission of HBV occurs during breast feeding.

759. C. Hepatitis C

The rate of chronic carriage of HCV is much higher than the rate of chronic carriage of HBV.

760. B. Flavivirus

- HCV is a member of the flavivirus family.
- It is an enveloped virion containing a genome of single-stranded, positive-polarity RNA.
- It has no virion polymerase.

761. C. Hepatitis E virus

Clinically the disease due to hepatitis E resembles hepatitis A, with the exception of a high mortality rate in pregnant women.

762. A. Hepatitis C

The rate of chronic carriage of HCV is much higher than the rate of chronic carriage of HBV.

763. C. Feco-oral route

- HAV is transmitted by the fecal–oral route.
- Humans are the reservoir for HAV.
- Virus appears in the feces roughly 2 weeks before the appearance of symptoms, so quarantine of patients is ineffective.
- Children are the most frequently infected group, and outbreaks occur in special living situations such as summer camps and boarding schools.
- Common-source outbreaks arise from fecally contaminated water or food such as oysters grown in polluted water and eaten raw.
- Unlike HBV, HAV is rarely transmitted via the blood, because the level of viremia is low and chronic infection does not occur.

764. B. Feco-oral

- HEV is a major cause of hepatitis transmitted by the fecal–oral route.
- It is thought to be more common than HAV in many developing countries.
- It is a common cause of waterborne epidemics of hepatitis in Asia, Africa, India, and Mexico but is uncommon in the West.

765. B. HBeAg

- HBeAg arises during the incubation period and is present during the prodrome and early acute disease and in certain chronic carriers.
- Its presence indicates a high likelihood of transmissibility, and, conversely, the finding of HBeAb indicates a lower likelihood, but transmission can still occur.

766. B. Hepatitis B

- HBV is a member of the hepadnavirus family.
- It is a 42-nm enveloped virion, with an icosahedral nucleocapsid core containing a partially double-stranded circular DNA genome.

767. D. HEV

HAV and HEV do not cause chronicity.

768. B. Ayw

769. D. Resembles some plant viruses

It has been proposed that HDV may have originated from a class of plant pathogens called viroids, which are much smaller than viruses.

770. C. Hepatitis B RNA virus

Please refer to explanation to question 766.

771. A. HBsAg

- The vaccine (e.g., Recombivax) contains HBsAg produced in yeasts by recombinant DNA techniques.
- The vaccine is highly effective in preventing hepatitis B and has few side effects. The seroconversion rate is approximately 95% in healthy adults.
- It is indicated for people who are frequently exposed to blood or blood products, such as certain health care personnel (e.g., medical students, surgeons, and dentists), patients receiving multiple transfusions or dialysis, patients with frequent sexually transmitted disease, and abusers of illicit intravenous drugs.

772. B. Hep D

- HDV is unusual in that it is a defective virus (i.e., it cannot replicate by itself because it does not have the genes for its envelope protein).
- HDV can replicate only in cells also infected with HBV because HDV uses the surface antigen of HBV (HBsAg) as its envelope protein.
- HBV is therefore the helper virus for HDV.

773. C. Stool

774. B. Can be cultured

- Amongst hepatitis viruses, only hepatitis A can be cultured.

775. D. Hepatitis E

Hepatitis E is transmitted via faeco-oral route.

776. D. HDV is a DNA virus

Please refer to explanation to question 766.

777. A. SS RNA virus

- HDV is an enveloped virus with an RNA genome that is a single-stranded, negative-polarity, covalently closed circle.
- The RNA genome of HDV is very small and encodes only one protein, the internal core protein called delta antigen.
- HDV genome RNA has no sequence homology to HBV genome DNA.
- HDV has no virion polymerase; the genome RNA is replicated and transcribed by the host cell RNA polymerase.

778. B. IgM anti HBc

- Anti-HBc IgM is the first antibody to be elevated following infection.
- It appears within first 1- 2 weeks after the appearance of HBsAg and lasts for 3-6 months.
- Its presence indicates acute hepatitis B infection.

779. C. Cytomegalovirus

- CMV retinitis is an important cause of blindness in immunocompromised patients, particularly patients with advanced AIDS .
- Early lesions consist of small, opaque, white areas of granular retinal necrosis that spread in a centrifugal manner and are later accompanied by hemorrhages, vessel sheathing, and retinal edema.
- CMV retinopathy must be distinguished from that due to other conditions, including toxoplasmosis, candidiasis, and herpes simplex virus infection.

780. B. Single stranded RNA

The genome of HIV consists of two identical molecules of single-stranded, positive-polarity RNA and is said to be diploid.

781. C. Dendritic cells do not support replication

- Dendritic cells (DCs) may play an important role in the initiation of HIV infection by virtue of the ability of HIV to bind to cell-surface C-type lectin receptors, particularly DC-SIGN .
- This allows efficient presentation of virus to CD4+ T cell targets that become infected; complexes of infected CD4+ T cells and DCs provide an optimal microenvironment for virus replication.
- There has been considerable disagreement regarding the HIV infectibility and hence the depletion as well as the dysfunction of DCs themselves.
- The situation has recently been clarified by the recognition that DCs can be classified into myeloid (mDC) and plasmacytoid (pDC) subsets, leading to an appreciation of specific DC dysfunction in HIV disease.
- pDCs are an important component of the innate immune system and secrete large amounts of IFN-α in response to viral infections.
- The numbers of circulating pDCs are decreased in HIV infection through mechanisms that remain unclear.
- It has recently been demonstrated that HIV gp120 interacts directly with pDCs and interferes with TLR9 activation, resulting in a decreased ability of pDCs to secrete antiviral and inflammatory factors that play a role in immune responses against invading pathogens.

782. A. Mycobacterium avium intracellulare

783. A. Opportunistic infection

Symptomatic HIV infection (AIDS Related Complex, ARC):

After variable period of clinical latency, the CD4 T cell level starts falling. Eventually patients develop constitutional symptoms such as

- Unexplained diarrhea lasting for more than I month .

- Weight loss more than 10% of body weight, fatigue malaise and night sweat .
- Mild opportunistic infections such as oral thrush.

784. C. Put the dressing material directly in an appropriate bag and send for incineration.

No pre treatment is needed for incineration, in case incineration is not done, pretreatment with hypochlorite is required.

785. B. Vascular

- The pathogenesis of KS is complex; fundamentally, it is an angioproliferative disease that is not a true neoplastic sarcoma, at least not in its early stages.
- It is a manifestation of excessive proliferation of spindle cells that are believed to be of vascular origin and have features in common with endothelial and smooth-muscle cells.

786. C. HIV ELISA

- Antibodies to HIV typically appear 10 to 14 days after infection, and most patients will have seroconverted by 3 to 4 weeks after infection.
- The inability to detect antibodies prior to that time can result in "false-negative" serologic tests (i.e., the person is infected, but antibodies are not detectable at the time of the test).
- This has important implications because HIV can be transmitted to others during this period.

787. A. CD4 + helper cells

- HIV infects helper T cells (CD4-positive cells) and kills them, resulting in suppression of cell-mediated immunity.
- This predisposes the host to various opportunistic infections and certain cancers such as Kaposi's sarcoma and lymphoma.
- HIV infection also targets a subset of CD4-positive cells called Th17 cells. These cells are an important mediator of mucosal immunity, especially in the gastrointestinal tract.

788. D. Sinus disease

Clincal Categories of Hiv Infection

Category A: Consists of one or more of the conditions listed belwo in an adolescent or adult (>13 years) with documented HIv infection. Conditions listed in categories B and C must not have occurred.

Asymptomatic HIV infection

Persistent generalized lymphadenopathy

Acute (primary) HIV infection with accompanying illness or history of acute HIV infection

Category B: Consists of symptomatic conditions in an HIV-infected adolescent or adult that are not incldued among conditions listed in clinical category C and that meet at least one of the following criteria: (1) The conditin sare attributed to HIV infection or are indicative of a defect in cell-mediated immunity; or (2) the conditions are considered by physicians to have a clinical course or to require management that is complicated by HIV infeciton. Examples include, but are not limited to the following:

Bacillary angiomatosis

Candidiasis, oropharyngeal (thrush)

Candidiasis, vulvovaginal; persistent, frequent, or poorly responsive to therapy

Cervical dysplasia (moderate or severe)/cervical carcinoma in situ

Constitutional symptoms, such as fever (38.50C) or diarrhea lasting > 1 month

Hairy leukoplakis, orla

Herpes zoster (shingles), involving at least two distince epidsoed or more than one dermatome

Idiopathic thrombocytopenic purpura

Listeriosis

Pelvic inflammatory disease, particularly if complicated by tuboovarian abscess

Peripheral neuropathy

Category C: Conditions listed in the AIDS surveillance case definition

Candidiasis of bronchi, trachea, or lungs

Candidiasis, esophageal
Cervical cancer, invasive3
Coccidioidomycosis, disseminated or extrapulmonary
Cryptococcosis, extrapulmonary
Crptosporidiosis, chronic intestinal (>1 months' duration)
Cytomegalovirus disease (Other than liver, spleen, or nodes)
Cytomegalovirus retinitis (with loss of vision)
Encephalopathy, HIV-related
Herpes simplex: chronic ulcer(s) (>1 month's duration); or bronchitis, pneumonia, or esophatitis
Histoplasmosis, disseminated or extrapulmonary
Isosporiasis, chronic intestinal (>1 month's duration)
Kaposi's sarcoma
Lymphoma, Burkitt's (or equivalent term)
Lymphoma, primary, of brain
Mycobacterium avium complex or M. Kansasii, disseminated or extrapulmonary
Mycobacterium tuberculosis, any site (pulmonarya or extrapulmonary)
Mycobacterium, other species or unidentified species, dissminated or extrapulmonary
Pneumocystis jiroveci pneumonia
Pneumonia, recurrenta
Progressive multifocal leukoencephalopathy
Salmonella septicemia, recurrent
Toxoplasmosis of brain
Wasting syndrome due to HIV

789. C. Cryptococcus

Cryptococcus neoformans causes subacute to chronic meningitis in HIV-AIDS.

790. E. None

791. A. CD4

Please refer to explanation to question 787.

792. B. 1983

793. A. M. tuberculosis

Worldwide, approximately one-third of all AIDS related deaths are associated with TB, and TB is the primary cause of death for 10–15% of patients with HIV infection.

794. B. Core antigen

Like other retroviruses, HIV-1 has genes that encode the structural proteins of the virus: gag encodes the proteins that form the core of the virion (including p24 antigen); pol encodes the enzymes responsible for protease processing of viral proteins, reverse transcription, and integration; and env encodes the envelope glycoproteins.

795. A. 0.3%

Large, multi-institutional studies have indicated that the risk of HIV transmission following skin puncture from a needle or a sharp object that was contaminated with blood from a person with documented HIV infection is ~0.3% and after a mucous membrane exposure it is 0.09% if the injured and/or exposed person is not treated within 24 h with antiretroviral drugs.

796. B. Cryptosporidium

- Cryptosporidial infection may present in a variety of ways, ranging from a self-limited or intermittent diarrheal illness in patients in the early stages of HIV infection to a severe, life-threatening diarrhea in severely immunodeficient individuals.
- In patients with untreated HIV infection and CD4+ T cell counts of <300/μL, the incidence of cryptosporidiosis is ~1% per year.
- In 75% of cases the diarrhea is accompanied by crampy abdominal pain, and 25% of patients have nausea and/or vomiting.
- Cryptosporidia may also cause biliary tract disease in the HIV-infected patient, leading to cholecystitis with or without accompanying cholangitis and pancreatitis secondary to papillary stenosis.

797. C. Retrovirus

- HIV is one of the two important human T-cell lymphotropic retroviruses (human Tcell leukemia virus is the other).
- HIV preferentially infects and kills helper (CD4) T lymphocytes,

resulting in the loss of cell-mediated immunity and a high probability that the host will develop opportunistic infections.

- Other cells (e.g., macrophages and monocytes) that have CD4 proteins on their surfaces can be infected also.

798. B. CD4 + T lymphocytes

Please refer to explanation to question 207.

799. A. Seen in heterosexual only

- HIV infection is predominantly a sexually transmitted disease (STD) worldwide.
- By far the most common mode of infection, particularly in developing countries, is heterosexual transmission, although in many Western countries a resurgence of male-to-male sexual transmission has occurred.

800. C. RNA dependent DNA polymerase

- Reverse transcriptase is the RNA-dependent DNA polymerase that is the source of the family name retroviruses.
- This enzyme transcribes the RNA genome into the proviral DNA.
- Reverse transcriptase is a bifunctional enzyme; it also has ribonuclease H activity.
- Ribonuclease H degrades RNA when it is in the form of an RNA–DNA hybrid molecule.
- The degradation of the viral RNA genome is an essential step in the synthesis of the double-stranded proviral DNA.

801. A. ELISA

- The presumptive diagnosis of HIV infection is made by the detection of antibodies in the patient's serum to the p24 protein of HIV using the enzyme-linked immunosorbent assay (ELISA) test.
- Because there are some false-positive results with this test, the definitive diagnosis is made by Western blot (also known as Immunoblot) analysis, in which the viral proteins are displayed by acrylamide gel electrophoresis, transferred to nitrocellulose paper (the blot), and reacted with the patient's serum. If antibodies are present in the patient's serum, they will bind to the viral proteins (predominantly to the gp41 or p24 protein).
- Enzymatically labeled antibody to human IgG is then added.
- A color reaction reveals the presence of the HIV antibody in the infected patient's serum.

802. D. Rb

Rb is retinoblastoma gene.

803. C. 6-8 weeks

- The p24 antigen becomes detectable after 1to 2weeks (mean 12 days) of infection and lasts for 3-4 weeks thereafter.
- Again, it is elevated during the late advanced stage of AIDS.

804. D. Tat gene

- In addition to the three typical retroviral genes gag, pol, and env, which encode the structural proteins, the genome RNA has six regulatory genes .
- Two of these regulatory genes, tat and rev, are required for replication, and the other four, nef, vif, vpr, and vpu, are not required for replication and are termed "accessory" genes.

805. A. Risk of HIV in the baby is up to 90%

- HIV infection can be transmitted from an infected mother to her fetus during pregnancy, during delivery, or by breast-feeding.
- This remains an important form of transmission of HIV infection in certain developing countries, where the proportion of infected women to infected men is ~1:1.
- Virologic analyses of aborted fetuses indicate that HIV can be transmitted to the fetus during the first or second trimesters of pregnancy.

- However, maternal transmission to the fetus occurs most commonly in the perinatal period.
- Two studies performed in Rwanda and the former Zaire indicated that the relative proportions of mother-to-child transmissions were 23–30% before birth, 50–65% during birth, and 12–20% via breast-feeding.

806. C. Aspergillosis

- Most important risk factor for aspergillosis is neutropenia.
- Neutrophil count remains normal until late stages of HIV infection, hence aspergillosis is an uncommon infection in HIV-AIDS.

807. C. Toxoplasmosis

- The most common clinical presentation of cerebral toxoplasmosis in patients with HIV infection is fever, headache, and focal neurologic deficits.
- Patients may present with seizure, hemiparesis, or aphasia as a manifestation of these focal deficits or with a picture more influenced by the accompanying cerebral edema and characterized by confusion, dementia, and lethargy, which can progress to coma.
- The diagnosis is usually suspected on the basis of MRI findings of multiple lesions in multiple locations, although in some cases only a single lesion is seen. Pathologically, these lesions generally exhibit inflammation and central necrosis and, as a result, demonstrate ring enhancement on contrast MRI or, if MRI is unavailable or contraindicated, on double-dose contrast CT.

808. B. CCR 5

- The T cell–tropic strains of HIV bind to CXCR4, whereas the macrophage-tropic strains bind to CCR5.
- Mutations in the gene encoding CCR5 endow the individual with protection from infection with HIV.
- People who are homozygotes are completely resistant to infection, and heterozygotes progress to disease more slowly.
- Approximately 1% of people of Western European ancestry have homozygous mutations in this gene, and about 10% to 15% are heterozygotes.
- One of the best-characterized mutations is the delta-32 mutation, in which 32 base pairs are deleted from the CCR5 gene.

809. B. Enhancing viral replication

Nef/ Negative effector (p27) :

- Promotes downregulation of surface CD4 and MHC 1 expression.
- Blocks apoptosis.
- Enhance virion infectivity .
- Alters state of cellular activation .
- Progression to disease slowed significantly in absence of nef.

Mycology — Questions

810. Aspergilloma has:

a. Septate hyphae
b. Pseudohyphae
c. Metachromatic hyphae
d. No hyphae

811. Maltese cross seen on polarizing microscopy in

a. Cryptococcus neoformans
b. Penicillium marneffi
c. Blastomyces
d. Candida albicans

812. Organism which cannot be grown on artificial culture media

a. Rhinosporidium seeberi
b. Penicillium marneffi
c. Aspergillus flavus
d. Sporothrix schenckii

813. All can cause candidiasis EXCEPT

a. DM
b. HTN
c. Ca Breast
d. Pregnancy

814. The organism most commonly found in intertrigo

a. Candida
b. Trichophyton
c. Streptococcus
d. Staphylococcus

815. Following cause pyogenic meningitis except

a. N. meningitis
b. H. influenzae
c. S. pneumonia
d. C. neoformans

816. Which of the following is characterized by formation of septate brown colored hyphae in vivo?

a. Candidiasis
b. Phaeohyphomycosis
c. Nocardiosis
d. Histoplasmosis.

817. Cryptococcus neoformans has been found most often in

a. water
b. soil containing pigeon feces
c. chicken feces
d. desert soil

818. Commonest fungal cause of corneal ulceration is

a. Candida
b. Aspergillus
c. Penicilium
d. Mucor

819. Valley fever or desert rheumatism is

a. histoplasmosis
b. blastomycosis
c. Coccidioidomycosis
d. aspergillosis

820. A patient, resident of Himachal Pradesh presented with a series of ulcers in a row, on his right leg. The biopsy from the affected area was taken and cultured on Sabauraud's Dextrose agar. What would be the most likely causative organism?

a. Sporothrix schenckii
b. Cladoporium spp.
c. Pseudoallescheria boydii
d. Nocadiabrasielensis

821. The following fungi are thermally dimorphic except:

a. Sporothrixschenkii
b. Cryptococcus neoformans
c. Blastomyces dermatitidis
d. Histoplasma capsulatum

822. Infection with Sporothrix schenkii is an occupational hazard for gardners. The portal of entry for this organism is via which of the following routes?

a. Lymphatic system
b. Mouth
c. Mucous membranes
d. Respiratory tract
e. Skin

810. a	811. a	812. a	813. b	814. a	815. d	816. b	817. b	818. b	819. c
820. a	821. b	822. e							

823. Inhalation of fungal spores can cause primary lung infections. Of the following organisms, which one is most likely to be associated with this mode of transmission?
a. C. albicans
b. C. tropicalis
c. S. schenkii
d. C. immitis

824. Tinea versicolor is caused by which of the following?
a. E. floccosum
b. E. werneckii
c. M. furfur
d. M. canis
e. T. beigelii

825. Which of the following are associated with chromoblastomycosis?
a. Tuberculate macroconidia
b. Spherules
c. Sclerotic bodies
d. Arthroconidia

826. A florist presents with a lymphocutaneous infection of the right hand and forearm. What is the most probable fungal etiologic agent?
a. Cladosporium carrionii
b. Phialophora verrucosa
c. Sporothrix schenckii
d. Trichosporoncutaneum

827. Which of the following yeasts divides by binary fission
a. Penicillium marneffei
b. Candida albicans
c. Cryptococcus neoformans
d. Saccharomyces cerevisiae

828. Breakthrough zygomycetes infection can occur during pulmonary invasive aspergillosis following treatment with
a. Voriconazole
b. Posaconazole
c. Amphotericin B
d. Caspofungin

829. Tissue should not be minced during processing for isolation of the following
a. Mucor spp.
b. Aspergillus spp.
c. Penicillium spp.
d. Candida spp.

830. Id reaction is associated with
a. Mucor spp.
b. Aspergillus spp.
c. Dermatophytes
d. Yeast

831. A preterm, LBW infant delivered by LSCS after IVF was put on ventilator in NICU for severe RDS. The respiratory distress subsided on day 7 and TPN with lipid formulation was started from day 10. The neonate developed signs of sepsis on day 15. The most likely causative agent is
a. Gram negative bacteria
b. Gram positive bacteria
c. Malassezia
d. Candida

832. All are true about fungus except
a. Cell wall of fungus contain chitin, mannan and glucans which are not seen in bacteria
b. Echinocandins are cell wall inhibitors
c. Sporulation in fungus is for survival as well as reproduction unlike bacteria
d. Sporulation has no diagnostic value

833. All are thermally dimorphic fungi except
a. Candida albicans
b. Histoplasma capsulatum
c. Blastomyces dermatitidis
d. Coccidioidomyces immitis

834. All are asexual spores except
a. Chlamydoconidia
b. Blastospores
c. Arthrospores
d. Ascospores

823. d	824. c	825. c	826. c	827. a	828. a	829. a	830. c	831. c	832. d
833. a	834. d								

835. A premature infant born at 24 weeks gestation after IVF had a birth weight of 800 gms. O2 was instituted by head box due to recurrent apnea. TPN was instituted with both amino acid and lipid formulation. After 10 days the baby develops signs of sepsis but blood culture was negative. However blood culture for fungus revealed a fungus with round oval cells and short hyphae. The causative agent is

a. Malassezia furfur
b. Candida albicans
c. Histoplasma capsulatum
d. Trichosporon

836. Dermatophytic infections are characterized by

a. Aflatoxin induced hallucinations
b. Confined to keratinized tissues
c. Easily treatable with penicillin
d. Marked by alveolar irritation

837. All are true regarding Id reaction seen in dermatophytes except

a. Due to aggressive treatment with terbinafine
b. Common in children
c. Incidence rate 5%
d. Anthropophilic dermatophyte is more commonly associated than Zoophilic and Geophilic dermatophytes

838. Hair perforation test is positive in

a. Trichophyton rubrum
b. Trichophyton mentagrophyte
c. Microsporum gypseum
d. Epidermophyton floccosum

839. All are true regarding Sporothrix schenkii except

a. Most common risk factor is thorn prick
b. It is a dimorphic fungus
c. Primary pulmonary sporotrichosis is the most common presentation
d. Spreads via lymphatic to produce a series of ulcers

840. A chronically ill young white male is unable to work due to his frequent illnesses. He spends most of his time raising and training pigeons. He develops a mild pulmonary infection and eventually presents to his primary care physician with headache, mental status changes and fever. A clinical diagnosis of meningitis is confirmed with LA test on CSF for capsular polysaccharide Ag of the organism. Which would be the best screening media for this organism for isolation

a. Niger seed agar
b. Sabouraud's Dextrose agar
c. Mannitol salt agar
d. Sorbitol MacConkey agar

841. In Chromoblastomycosis, all are true except

a. Dematiceous fungi are the etiological agent
b. Hyaline fungi are the etiological agent
c. Sclerotic bodies are pathognomonic
d. Systemic invasion is very rare

842. All are true in eumycetoma except

a. Causative agents are hyaline and phaeoid fungi
b. Tumour mass is usually single and well defined
c. Opening of sinuses are flat and not flared up
d. Less extensive with osteolytic lesions

843. Histoplasma capsulatum, a dimorphic fungus is found in soil heavily contaminated with bird droppings. Which of the following statements best describes the presence of the organism in tissue biopsies

a. Arthrospores
b. Oval budding yeasts inside macrophages
c. Spherules filled with endospores
d. Yeasts with broad base bud

844. All are true about African Histoplasmosis except

a. Caused by Histoplasma capsulatum var duboisi
b. Yeast are larger and thick walled
c. Pronounced giant cell formation in infected tissue
d. Dissemination is rarely encountered

835. a	836. b	837. d	838. b	839. c	840. a	841. b	842. d	843. b	844. d

845. A 10 years old female patient with thalassemia and diabetes is admitted to ICU because of sudden swelling on the right side of the face and an episode of bleeding from the right nostril. She had recently developed signs of ketoacidosis and renal insufficiency. Her blood sugar level at the time of admission is 700 mg/dL. The facial lesion becomes partially necrotic and shows slight protrusion of the right eye and facial paralysis. The patient dies on the second day. Histopathologic examination of the lesions reveals occlusion of the small vessels and the presence of non-septate hyphae. This is most probably caused by which of the following

a. Candidiasis
b. Erysipelis
c. Gas Gangrene
d. Mucormycosis

846. Aspergillus is best described by

a. Round black sporangia filled with endospores, sporangia unbranched, rising from a runner called a stolon from aseptate hyphae
b. Thick walled spores with tubercle like projections all around, on septate hyphae
c. Widespread in environment, conidia may be inhaled microscopic appearance in specimen reveals dichotomous branching and septate hyphae
d. Rosette like cluster of conidia, on conidiophores, arising out of very thin septate hyphae

847. A ventilated patient in ICU develops invasive aspergillosis and is put on voriconazole. What is the best way to diagnose invasive aspergillosis in this case

a. Serum β galactomannan
b. Serum μESR
c. Serum Procalcitonin
d. Tracheal aspirate culture

848. Febrile neutropenia is seen in infection with

a. Candida
b. Aspergillus
c. Zygomycetes
d. Blastomyces

849. Which of the following is known to cause Ca-colon

a. Histoplasmin
b. Mycotoxin
c. Cryptococcus gatti
d. Fusarium

850. The nail clippings of a chronic infected nail subjected to 10% KOH showed plenty of fungal hyphae and on culture yielded a fluffy white mycelial growth in 10 days which on LPCB mount exhibits club shaped macroconidia in clusters, few chlamydoconodia and no microconidia. The most probable dermatophyte is

a. Trichophyton mentagrophyte
b. Trichophyton rubrum
c. Microsporum ferrugineum
d. Microsporum gypseum
e. Epidermophyton floccosum

851. An HIV infected person from Manipur, India with a CD4 count of 75 cells/ml presented with molluscum contagiosum like lesions on face and upper trunk. Aspiration cytology revealed both intra and extracellular septate yeasts and culture yielded a dimorphic fungus. The most likely agent is

a. Sporothrix schenckii
b. Penicillium marneffei
c. Histoplasma capsulatum
d. Blastomyces dermatitidis
e. Coccidioides immitis

852. Correctly matched stain (PGI)

a. Mucicarmine – Cryptococcus
b. Giemsa – Candida
c. Methanamine silver – Histoplasma
d. Grams – Pneumocystis jiroveci
e. PAS – Sporothrix schenckii

853. Reynolds-Braude phenomenon is demonstrated by which of the following yeasts (PGI)

a. Candida albicans
b. Candida tropicalis
c. Candida dubliniensis
d. Cryptococcus neoformans
e. Rhodotorula

845. d	846. c	847. a	848. a	849. b	850. e	851. b	852. a,c,e	853. a,c

854. Aflatoxins are produced by the following fungus

a. Aspergillus flavus
b. Fusarium moniliforme
c. Penicillium puberulum
d. Penicillium verrucosum
e. Aspergillus parasiticus

855. Dermatophytosis is caused by:

a. Herpes simplex b. Papilloma virus
c. Trichophyton d. Candida

856. Tinea pedis is caused by which of the following:

a. E. floccosum b. M. furfur
c. M. canis d. E. werneckii

857. Regarding fungal cell wall all are true except:

a. Contains chitin
b. Prevent osmotic damage
c. Azoles act on them
d. Does not contain peptidoglycan

858. Trichophyton species which is zoophilic

a. T. tonsurans
b. T. violaceum
c. T. schoenleinii
d. T. mentagrophytes

859. The capsule of Cryptococcus neoformans in a CSF sample is best seen by:

a. Gram's stain
b. Indian ink preparation
c. Giemsa stain
d. Methenamine-silver stain

860. Latex agglutination test of the antigen in CSF helps in the diagnosis of:

a. Cryptococcus b. Candidiasis
c. Aspergillosis d. Histoplasmosis

861. Cryptoccoccal meningitis is common in:

a. Renal transplant recipient
b. Agammaglobulinemia
c. Neutropenia
d. IgA deficiency

862. Pneumocystis carinii is a fungus because:

a. rRNA, mitochondrial protein gene sequence and presence thymidylate late synthase
b. Cell wall contains glucans
c. Antifungals are effective against P. carinii
d. Commonest infection in AIDS

863. Which dye is most suitable for fungus demonstration in biopsy:

a. Alizarin red
b. Verihoff dye
c. Mason's trichrome
d. PAS

864. In HIV infected individual Gram stain of lung aspirate shows yeast like morphology. All of the following are the most likely diagnosis except:

a. Candida tropicalis
b. Cryptococcus neoformans
c. Penicillium marneffei
d. Aspergillus fumigatus

865. Pneumocystis carinii is:

a. Bacteria
b. Fungus
c. Virus
d. Parasite

866. Rhinosporiduim seeberi is a

a. Bacteria
b. Algae
c. Protozoa
d. Virus

867. Pneumocystis carinii is diagnosed by:

a. Silver nitrate staining
b. Leishman staining
c. Fontana staining
d. Acid fast staining

868. Blastomycosis is characterized by all except:

a. Yeast-like fungus
b. Commonly involves lung and skin
c. Dimorphic fungus
d. Common in South America

854. a	855. c	856. a	857. c	858. d	859. b	860. a	861. a	862. a	863. d
864. d	865. b	866. c	867. a	868. d					

869. Which of the following feature is used for identification of Cryptococcus neoformans?

a. Oxidase +ve
b. Dextran fermentation
c. Hydrolyze urea
d. Ability to grow at 42°C

870. Renauld Braude phenomenon is seen is:

a. Candida albicans
b. Candida psittaci
c. Histoplasma
d. Cryptococcus

871. Which of the following is only yeast:

a. Candida
b. Mucor
c. Rhizopus
d. Cryptococcus

872. In a patient, corneal scraping reveals narrow angled septate hyphae. Which of the following is the likely etiologic agent:

a. Mucor
b. Aspergillus
c. Histoplasma
d. Candida

873. An early diabetic has left sided orbital cellulitis CT scan of paranasal sinus shows evidence of left maxillary sinusitis. Gram stained smear of the orbital exudate shows irregularly branching septate hyphae. The following is most likely etiological agent:

a. Aspergillus
b. Rhizopus
c. Mucor
d. Candida

874. Common fungus causing corneal ulcer:

a. Aspergillus
b. Mucor
c. Fusarium
d. Sporothrix

875. A young woman complains of recurrent rhinitis, nasal discharge and bilateral nasal blockage since one year. She also had history of allergy and asthma. On examination, multiple polyps with mucosal thickening and impacted secretions are seen in nasal cavities. Biopsy was taken and the material on culture showed many hyphae with dichotomous branching typically at 45 degree. Which of the following is most likely organism responsible?

a. Rhizopus
b. Aspergillus
c. Mucor
d. Candida

876. Which of the following is an aseptate fungus

a. Aspergillus
b. Candida
c. Nocardia
d. Rhizopus

877. Aseptate hyphae is not seen in:

a. Rhizopus
b. Mucor
c. Aspergillus
d. None

878. A series of ulcers in lower extremities in sub-Himalayan area is often caused by:

a. Trichophyton rubrum
b. Pseudallescheria boydii
c. Cladosporium species
d. Sporothrix schenckii

879. The following fungi are thermally dimorphic, except:

a. Sporothrix schenkii
b. Cryptococcus neoformans
c. Blastomyces dermatitidis
d. Histoplasma capsulatum

880. A gardener has multiple vesicles on hand and multiple eruptions along the lymphatic. Most common fungus responsible is:

a. Sporothrix schenckii
b. Cladosporium
c. Histoplasma
d. Candida

881. Darling disease is caused by:

a. Histoplasma
b. Cryptococcus
c. Rhizopus
d. Blastomycosis

882. pH of Sabouraud's dextrose agar is adjusted to:

a. 4-6
b. 1-2
c. 6-8
d. 8-10

869. c	870. a	871. d	872. b	873. a	874. a	875. b	876. d	877. c	878. d
879. b	880. a	881. a	882. a						

Mycology — Explanations

810. A. Septate hyphae

- Aspergillus has septate hyaline hyphae with dichotomous branching.
- Pseudohyphae seen in candida albicans
- Metachromatic hyphae seen in dematiaceous fungi

811. A. Cryptococcus neoformans

- In polarizing microscopy, Cryptococcus neoformans has Maltese cross appearance.
- Blastomyces in biopsy look like broad based yeast with refractile cell wall.
- Candida albicans in tissues forms Pseudohyphae

812. A. Rhinisporidium seeberi

- Now R. seeberi is considered as protozoa and it is not cultivable.
- Other choices are the fungi grown in SDA.

813. B. HTN

- Predisposing factor for candida infection is mainly due to CMI deficiency.
- DM, HIV, Pregnancy, Malignancy, Steroid therapyand transplantation.

814. A. Candida

- Intertrigo refers to a type of inflammatory rash (dermatitis) of the superficial skin that occurs within a person's body folds.
- Areas of the body which are more likely to be affected by intertrigo include the inframammary fold, intergluteal cleft, armpits, and spaces between the fingers or toes. Skin affected by intertrigo is more prone to infection than intact skin.
- The term "intertrigo" commonly refers to a secondary infection with bacteria (such as Corynebacterium minutissimum), fungi (such as Candida albicans), or viruses. A frequent manifestation is Candidial intertrigo.

815. D. C. neoformans

- Bacterial meningitis are usually pyogenic meningitis except leptospiral and tuberculous meningitis.
- Fungal and viral meningitis are aseptic meningitis. Lymphocytes are predominant in microscopic examination

816. B. Phaeohyphomycosis

- Phaeohyphomycosis is a heterogeneous group of mycotic infections caused by dematiaceous fungi whose morphologic characteristics in tissue include hyphae, yeast-like cells, or a combination of these.
- They are associated with pigmented hyphae

817. B. soil containing pigeon feces

- C. neoformans occurs widely in nature and grows abundantly in soil containing bird(especially pigeon) droppings. The birds are not infected.
- Human infection resultsfrom inhalation of the organism. There is nohuman-to-human transmission.
- C. gattii is associated with eucalyptus trees, most often in the northwestern states of theUnited States. It is also found in subtropical and tropical areas of many countries.

818. B. Aspergillus

- Most common cause of fungal keratitis is Aspergillus fumigatus, followed by Candida albicans and Fusarium.

819. C. Coccidioidomycosis

- C. immitis is a dimorphic fungus that exists as a mold in soil and as a spherule intissue .

- Some infected persons have an influenza like illness with fever and cough. About 50% have changes in the lungs (infiltrates, adenopathy, or effusions) as seen on chest X-ray, and 10% develop erythema nodosum or arthralgias.
- This syndrome is called "valley fever" (in the San Joaquin Valley of California) or "desert rheumatism" (in Arizona); it tends tosubside spontaneously

820. A. Sporothrix schenckii

- Sporotrichosis is a chronic pyogenic granulomatous lesion ofthe skin and subcutaneous tissue caused by Sporothrix schenckii.
- S. schenckii is a dimorphic fungus found all over the world. The fungus is found in soil, decaying woods, thorns, and on infectedanimals including rats, cats, dogs, and horses.
- It causes Rose Gardener's disease – Ulcers along the lymphatic draining.

821. B. Cryptococcus neoformans

- Dimorphic fungi exist as hyphal/ mycelial forms in the soil and in the cultures at 22–25°C. They occur as yeasts or other structuresin human tissue and in the culture at 37°C
- Examples include Coccidioides immitis, Paracoccidioides brasiliensis, Histoplasmacapsulatum, Blastomyces dermatitidis, Sporothrix schenckii and P. marneffi.

822. E. Skin

- Sporothrix schenckii is a dimorphic fungus. The mold form lives on plants, and theyeast form occurs in human tissue.
- When spores of the mold are introduced into theskin, typically by a thorn, it causes a local pustule or ulcer with nodules along thedraining lymphatics.

823. D. C. immitis

- C. immitis : inhalation of arthroconidia
- Candidia is endogenous.
- Sporothrix transmitted via skin mainly by thorn prick.

824. C. M. furfur

- Tinea versicolor (pityriasis versicolor), a superficial skin infection of cosmeticimportance only, is caused by Malassezia furfur.
- The lesions are usually noticed ashypopigmented areas, especially on tanned skin in the summer.
- Diagnosis is usually made by observing this mixture in KOH preparations ofskin scrapings. Culture is not usually done. The treatment of choice is topicalmiconazole, but the lesions have a tendency to recur. Oral antifungal drugs, such asfluconazole or itraconazole, can be used to treat recurrences.

825. C. sclerotic bodies

- This is a slowly progressive granulomatous infection that is caused by several soilfungi (Fonsecaea, Phialophora, Cladosporium, etc.) when introduced into the skinthrough trauma.
- In the clinical laboratory,dark brown, round fungal cells are seen in leukocytes or giant cells called as sclerotic bodies or copper penny bodies. The disease istreated with oral flucytosine or thiabendazole, plus local surgery.

826. C. Sporothrix schenckii

Refer Q. No 820.

827. A. Penicillium marneffei

- Penicillium marneffei is a dimorphic fungus that causes tuberculosis-like disease inAIDS patients, particularly in Southeast Asian countries such as Thailand.
- It divides by binary fission. The treatment of choiceconsists of amphotericin B for 2 weeks followed by oral itraconazole for 10 weeks.

828. A. Voriconazole

- Breakthrough invasive fungal diseases during voriconazole treatment are concerning, as they are associated with high rates of mortality and pathogen distribution.
- Voriconazle is not effective against Zygomycetes.

829. A. Mucor spp.

- Zygomycetes are having aseptate hyphae. Mincing leads to death of the hyphae. So culture yield will be very low.

830. C. dermatophytes

- Hypersensitivity to dermatophyte antigens leads toappearance of secondary eruption in sensitized patients because of presence of circulation of allergenicproducts.

831. C. Malassezia

- Malassezia furfur is a lipophilic fungus that is found on skin.
- It causesfungemia, primarily in premature infants on high-lipid intravenous supplements.

832. D. Sporulation has no diagnostic value

- Fungal spores are classified as Sexual and asexual spores and they are used as a diagnostic tool for fungal infections

833. A. Candida albicans

- Candida albicans is non thermally dimorphic fungus which is mold form in issues and yeast form in culture.
- All other choices are Thermally dimorphic fungi

834. D. Ascospores

- Example for Asexual spores are, Blastospore, conidiospore, arthrospore and Chlamydospore

835. A. Malassezia furfur

Refer Q. no 824

836. B. Confined to keratinized tissues

- Dermatophytoses are caused by fungi (dermatophytes) that infect only superficialkeratinized structures (skin, hair, and nails), not deeper tissues.
- The most importantdermatophytes are classified in three genera: Trichophyton, Epidermophyton, andMicrosporum.

837. D. Anthropophilic dermatophyte is more commonly associated than Zoophilic and Geophilic dermatophytes

Refer Q. no : 836

838. B. Trichophyton mentagrophyte

- This test is performed to differentiate T. rubrum from T. mentagrophytes.
- T. mentagrophyte is positive and T. rubrum is negative for the test.

839. C. Primary pulmonary sporotrichosis is the most common presentation

- This subcutaneous, nodular, fungal disease is generally not painful. When it spreads via thelymphatics (lymphocutaneous sporotrichosis), it produces a chain of lesions on the extremities, with the older (lower) lesions ulcerating and the newer (upper) ones starting nodular.

840. A. Niger seed agar

- A case of Cryptococcal meningitis.
- Niger seed agar and bird seed agar is used to demonstrate melanin production and it produces black or brown color colonies.

841. B. Hyaline fungi are the etiological agent

Refer Q No 825

842. D. Less extensive with osteolytic lesions.

- Eumycotic mycetoma is a subcutaneous fungal disease characterized by (1) swelling(tumefaction), (2) sinus tracts erupting through the skin (if not treated), and (3) presence of"sulfur" granules (microcolonies) in the exudate.
- It is caused by Pseudallescheria boydii and Madurella species, which are filamentous truefungi found in soil or on vegetation; entry is by traumatic implantation.3. It usually occurs in rural, third-world agricultural workers in the tropics

843. B. Oval budding yeasts inside macrophages

- Inhaled spores are engulfed by macrophages and develop into yeast forms.

- Intissues, H. capsulatum occurs as an oval budding yeast insidemacrophages. The yeasts survive within the phagolysosome of themacrophage by producing alkaline substances, such as bicarbonate and ammonia,which raise the pH and thereby inactivate the degradative enzymes of thephagolysosome.

844. D. Dissemination is rarely encountered

H. capsulatum var. capsulatum - classical histoplasmosis

- H. capsulatum var. duboisii - African histoplasmosis with frequent dissemination in skin and bone.

845. D. mucormycosis

- Patients with diabetic ketoacidosis, burns, bone marrow transplants, or leukemiaare particularly susceptible. Diabetic patients are particularly susceptible torhinocerebral mucormycosis, in which mold spores in the sinuses germinate to formhyphae that invade blood vessels that supply the brain.
- Rhizopusoryzae, causes about 60% of cases of mucormycosis.
- In biopsy specimens, organisms are seen microscopically as nonseptate hyphaewith broad, irregular walls and branches that form more or less at right angles

846. C. Widespread in environment, conidia may be inhaled microscopic appearance in specimen reveals dichotomous branching and septate hyphae

- Aspergillus species exist only as molds; they are not dimorphic. They have septatehyphae that form V-shaped (dichotomous) branches
- These molds are widely distributed in nature. They grow on decaying vegetation,producing chains of conidia. Transmission is by airborne conidia.A. fumigatus can colonize and later invade abraded skin, wounds, burns, the cornea,the external ear, or paranasal sinuses. It is the most common cause of fungalsinusitis.
- In immunocompromised persons, especially those with neutropenia, it caninvade the lungs and other organs, producing hemoptysis and granulomas.

847. A. Serum β galactomannan

- In persons with invasive aspergillosis, there may be high titers ofgalactomannan antigen in serum.
- Patients with ABPA have high levels of IgEspecific for Aspergillus antigens and prominent eosinophilia.

848. A. Candida

- Fever more > 38.5°C with absolute neutrophil count less than 500/µl.
- Defect in CMI or neutropenia, disseminated Candidainfections are common.

849. B. Mycotoxin

- Mycotoxins like aflatoxins, are coumarin derivatives produced byAspergillus flavus that cause liver damage and tumors in animals and are suspectedof causing hepatic carcinoma in humans.
- Aflatoxins are ingested with spoiled grainsand peanuts and are metabolized by the liver to the epoxide, a potent carcinogen.
- Aflatoxin B1 induces a mutation in the p53 tumor suppressor gene, leading to a lossof p53 protein and a consequent loss of growth control in the hepatocyte.

850. E. Epidermophyton floccosum

- Club chaped macroconidia without microconidia suggestive of Epidermophyton.
- Pencil shape Macroconidia – Trichophyton
- Spindle shape macroconidia – Microsporum.

851. B. Penicillium marneffei

- P. marneffei is the only dimorphic fungus in the genus Penicillium.
- It has been reported as an important opportunistic pathogenin AIDS patients.
- The fungus causes tuberculosis-like disease inpatients with AIDS in Southeast Asian countries like Thailand.

- Few case reports have also been documented from North Eastern part of India

852. A. Mucicarmine – Cryptococcus, C. Methanamine silver – Histoplasma & E. PAS – Sporothrix schenckii.

- Candida will not take Giemsa stain and Pneumocystis will not take Grams stain.

853. A. Candida albicans & C. Candida dubliniensis

- Germ tube is a rapid method for identification of C. albicans and Candida dubliniensis.
- This test dependson the ability of C. albicans to produce germ tube within 2 hourswhen incubated in serum at 37°C.
- This phenomenon iscalled Reynold–Braude phenomenon

854. A. Aspergillus flavus

- A mycotoxin is a toxic secondary metabolite produced by organisms of the fungus kingdom and is capable of causing disease and death in both humans and other animals.
- Aflatoxin produced by A. flavus

855. C. Trichophyton

- Refer Q No 836

856. A. E. floccosum

- Ringworm infection of the foot is called Tinea pedis or athletes foot.
- It is caused by T. rubrum, T. mentagrophytesvar. interdigitale and E. floccosum

857. C. Azoles act on them

- Azoles are acting by interfering the synthesis of ergosterol and leads to cell membrane damage.
- They act via 1-4 alpha demethylase

858. D. T. mentagrophytes

- Other zoophilic dermatophytes areT. equinum T. verrucosum M. canis and M. equinum

859. b. Indian ink preparation

- Capsule is best demonstrated by negative staining – India ink or Nigrosin.
- Methanamine silver nitrate is for fungal cell wall.

860. A. Cryptococcus

- CrAg test – Cryptococcal Antigen detection by Latex agglutination method is very simple, rapid and most sensitive and specific method for diagnosis of Cryptococcal meningitis.

861. A. Renal transplant recipient

- Disease caused byC. neoformans occurs mainly in patients with reduced cell-mediated immunity, especially AIDS patients, renal transplant recipients and Hodgkin's lymphoma.

862. A. rRNA, mitochondrial protein gene sequence and presence thymidylate late synthase

- Pneumocystis is a unicellular fungus found in the respiratorytracts of many mammals and humans.
- The genus Pneumocystiswas initially mistaken for trypanosome, then later as a protozoan.
- Biochemical analysis of the nucleic acid composition ofPneumocystis rRNA and mitochondrial DNA in 1980s established it as a fungus.
- The cyst wall closely resembles that offungi. However, it does not haveergosterol in its membrane asdo the fungi, but instead has cholesterol

863. D. PAS

- Potassium hydroxide in a wet mount (KOH mount) of skin scrapings breaks down the humancells, enhancing the visibility of the unaffected fungus.
- A nigrosin or India ink wet mount of cerebrospinal fluid (CSF) highlights the capsule of Cryptococcus neoformans but is very insensitive
- A Giemsa or Wright's stain of thick blood or bone marrow smear may detect the intracellularHistoplasma capsulatum.
- Calcofluor white stain "lights up" fungal elements in exudates, small skin scales, or frozen sections under a fluorescent microscope, giving the fungus a fluorescent blue-white appearanceon a black background

- Tissue specimens –GMS and PAS staining

864. D. Aspergillus fumigatus
- Refer Q No 810.

865. B. Fungus
- Currently Pneumocystis classified as fungus by molecular method.

866. C. Protozoa
- Currently R. seeberi is classified under protozoa.

867. A. Silver nitrate staining
- GMS staining of BAL specimen
- Demonstration of cup shape cyst is diagnostic for Pneumocystis

868. D. Common in South America
- This fungus is endemic primarily in eastern North America, especially in the regionbordering the Ohio, Mississippi, and St. Lawrence rivers, and the Great Lakesregion. Less commonly, blastomycosis has also occurred in Central and SouthAmerica, Africa, and the Middle East.
- It grows in moist soil rich in organic-material, forming hyphae with small pear-shaped conidia. Inhalation of the conidiacauses human infection

869. C. Hydrolyze urea
- Urease test and inositol fermentation test are positive for C. neoformans

870. A. Candida albicans
- Refer Q. No 853

871. D. Cryptococcus
- Candida – yeast like (Pseudohyphae)
- Rhizopus and Mucor are molds

872. B. Aspergillus
- Refer Q. No 810

873. A. Aspergillus
- Refer Q. No 810

874. A. Aspergillus
- Refer Q. No 818

875. B. Aspergillus
- Refer Q. No 810

876. D. Rhizopus
- Aspergillus :Septate hyphae with acute angle branching.
- Mucor and Rhizopus – Aseptate hyphae with right angle branching
- Candida - pseudohyphae

877. C. Aspergillus
- Aspergillus :Septate hyphae with acute angle branching.
- Mucor and Rhizopus – Aseptate hyphae with right angle branching

878. D. Sporothrix schenckii
- Refer Q. No 820

879. B. cryptococcus neoformans
- Refer Q. No : 821

880. A. Sporothrix schenckii
- Refer Q. No 820

881. A. Histoplasma
- Pulmonary manifestations of histoplasma is called as Darling's disease
- It is dimorphic fungus. Non capsulated.
- Also causes fungal flu and mimics like tuberculosis.

882. A. 4-6
- Fungi are frequently cultured on Sabouraud's agar, which facilitates theappearance of the slow-growing fungi by inhibiting the growth of bacteria in thespecimen.
- Inhibition of bacterial growth is due to the low pH (4-6) of the medium and tothe chloramphenicol and cycloheximide that are frequently added.
- The appearance ofthe mycelium and the nature of the asexual spores are frequently sufficient to identifythe organism.

Parasitology — Questions

883. The most virulent Plasmodium species causing malaria is:
a. Plasmodium vivax
b. Plasmodium falciparum
c. Plasmodium ovale
d. Plasmodium malaria

884. Which egg does not float in a saturated solution of saline?
a. Ankylostoma eggs
b. Trichuris eggs
c. Unferitilized eggs of Ascaris
d. Fertilized eggs of Ascaris

885. All causes brain lesions except:
a. Giardiasis b. Tuberculosis
c. Cysticercosis d. Bacteroides

886. HIV patient with malabsoption, fever, chronic diarrohea, with acid fast positive organism. What is the causative agent?
a. Giardia b. Microsporidia
c. Isospora d. E. histolytica

887. About Congenital toxoplasmosis, false is
a. Diagnosed by detection of IgM in cord blood
b. IgA is more sensitive than IgM for detection
c. Dye test is gold standard for IgG
d. Avidity testing must be done to differentiate between IgA & IgM

888. Malabsorption caused by A/E
a. Giardia
b. Ascaris
c. Strongyloides
d. Capillaria philipensis

889. Post kalazar dermal leishmaniasis is caused by
a. L.tropica b. L.infantum
c. L.major d. L.donovani

890. All the nematodes give birth to larvae except
a. Trichuris trichiura
b. Trichnella spiralis
c. Dracunculus medinensis
d. Wuchereria bancrofti

891. Amoebiasis is not transmitted through
a. Vertical Transmission
b. Faeco-oral
c. Cockroach
d. Oral

892. Which of the following is not a mosquito borne disease?
a. Filariasis
b. Trypanosomiasis
c. Dengue
d. Yellow fever

893. Sabin & Feldman dye test is used to diagnose infection with
a. Filariasis b. Toxoplasmosis
c. Histoplasmosis d. Ascariasis

894. Seat worm is
a. Enterobius b. Drancunculus
c. Ankylostoma d. Necator

895. Babesiosis is transmitted by
a. Dogs b. Jackals
c. Hard ticks d. Monkeys

896. Cranial calcification is caused by
a. Toxoplasmosis b. Syphilis
c. Rubella d. Tetanus

897. An AIDS patient presents to his primary care physician with a two week history of watery, non-bloody diarrhea. The most likely diagnosis is which of the following?
a. Acid-fast bacilli b. Enterocytozoon
c. Cryptosporidium d. Yeast

883. b	884. c	885. a	886. c	887. d	888. b	889. d	890. a	891. a	892. b
893. b	894. a	895. c	896. a	897. c					

898. A 30 year old female stored her contact lenses in tap water. She noticed deterioration in vision and visited an ophthalmologist, who diagnosed her with keratitis. Culture would likely reveal which of the following?

a. Acanthamoeba b. Babesia
c. Entamoeba coli d. Naeglaria
e. Pneumocystis

899. The diagnostics characteristics of Plasmodium falciparum are best diagnosed by which of the following statements?

a. An important diagnostic feature is the irregular appearance of the edges of the infected red blood cell
b. A period of 72 hours is required for the development of the mature schizont, which resembles a rosette with only 8 to 10 oval merozoites
c. Except in infections with very high parasitaemia, only ring forms of early trophzoites and the gametocytes are seen in the peripheral blood.
d. Schuffner stippling is routinely seen in red blood cells that harbor parasites
e. The signet ring shaped trophozoites is irregular in shape with amoeboid extensions of the cytoplasm

900. A divorced working mother takes her 4-year-old child to day care center. She has noticed that the child's frequent stools are non-bloody, foul smelling and fatty. The child has no fever. One should suspect infection with which parasite?

a. Amebiasis b. Ascariasis
c. Balantidiasis d. Giardiasis

901. Human infection with beef tapeworm usually is less serious than infection with pork tape worm, because of which of the following statements?

a. Acute intestinal obstruction is less common in beef tape worm infection
b. Beef tape worm eggs cause less irritation of the mucosa of the digestive tract
c. Larval invasion does not occur in beef tape worm infection
d. The adult beef tape worms are smaller in size
e. Toxic by-products are not given off by adult beef tape worm

902. Trypanosoma cruzi initially penetrates through the mucous membranes and then multiplies in a lesion known as chagoma. In the chronic stage of the disease, where are the main lesions often observed?

a. Digestive tract and heart
b. Heart and respiratory tract
c. Heart and liver
d. Liver and spleen
e. Spleen and pancreas

903. One of the most clinically significant infections in patients with AIDS is Pneumocystis jirovecii pneumonia. The method of choice for detection of P. jirovecii in respiratory specimens is which of the following?

a. Culture in rat lung cells
b. Direct fluorescent antibody microscopy
c. Indirect fluorescent antibody microscopy
d. Methenamine-silver stain
e. Toluidine blue stain

904. Which of the following protozoa is known to exist in the trophozoite stage only?

a. Balantidium coli
b. Entamoeba histolytica
c. Giardia lamblia
d. Toxoplasma gondii
e. Trichomonas vaginalis

905. A medical technologist visited Goa and consumed raw fish daily for two weeks. Six months after her return to her home, she had a routine physical examination and was found to be anemic. Her vitamin B12 levels were below normal. What is the most likely cause of her condition?

a. Cysticercosis
b. Infection with fish tape worm
c. Infection with Parvovirus B19
d. Infection with Yersinia

898. a	899. c	900. d	901. c	902. a	903. b	904. e	905. b

906. A renal transplant patient was admitted for graft rejection and pneumonia. A routine evaluation of his stool showed rhabditiform larva. Subsequent follow-up revealed similar worms in his sputum. What is the most likely organism?

a. Ascaris
b. Hymenolepis
c. Loa Loa
d. Necator
e. Strongyloides

907. Which of the following infections requires a mosquito for transmission?

a. Babesiosis
b. Bancroftian filariasis
c. Dog tape worm
d. Guinea worm
e. Leishmaniasis

908. E. histolytica infection is best diagnosed by which of the following?(PGI)

a. Baermann technique
b. Dilution followed by egg count
c. ELISA
d. Examination of a cellophane tape swab
e. Sigmoidoscopy and aspiration of mucosal lesions

909. A protozoan with a characteristic jerky motility is most commonly observed in which of the following?

a. Biopsied muscle
b. Blood
c. Duodenal contents
d. Sputum
e. Vaginal secretions

910. Crabs act as secondary intermediate hosts for

a. Paragonimus westermanii
b. Fasciola hepatica
c. Opisthorchis sinensis
d. Fasciolopsis buskii

911. Which of the following specimens is used to diagnose infections with Naegleria fowleri?

a. Cerebrospinal fluid
b. Corneal scraping
c. Blood
d. Urine

912. A previously healthy, 24-year-old man is brought to an emergency room because of seizures. A CAT scan reveals a solitary calcified lesion, 2 cm in diameter, in the right cerebral hemisphere. What is the most probable diagnosis?

a. Central nervous system coccidioidomycosis
b. Cerebral cysticercosis
c. Cerebral echinococcosis
d. Extraintestinal amebiasis

913. Which of the following, if ingested raw or poorly cooked, can be the source of Taenia saginata infections?

a. Pork
b. Beef
c. Lamb
d. Fish

914. A woman presents in third trimester with high fever. Her PS is positive for P.vivax.

a. There is a high chance of her baby developing malaria
b. The drug of choice is artesunate
c. She can develop complications
d. The baby may be LBW

915. All of the following can differentiate pathogenic from non-pathogenic Entamoeba except

a. Hematophagous trophozoite
b. Zymodeme analysis
c. Nested PCR
d. DNA PCR

916. The diagnostic characteristics of Plasmodium falciparum are best described by which of the following statements

a. An important diagnostic feature is the irregular appearance of the edges of the infected RBC
b. Except in infections with very high parasitemia only ring forms of the early trophozoites and the gametocytes are seen in the peripheral blood
c. Schuffner stippling is routinely seen in RBC that harbor parasites
d. The signet ring shaped trophozoites is irregular in shape with amoeboid extensions of the cytoplasm'

906. e	907. b	908. c,e	909. e	910. a	911. a	912. b	913. b	914. d
915. d	916. b							

917. Babesiosis is most commonly seen in
a. AIDS patients
b. Foresters
c. Patients without a spleen
d. Transfusion recipients

918. An AIDS patient presents to OPD with a 2 months history of watery, non-bloody diarrhea. The stool reveals acid fast oocysts of 6 µm size. All are characteristic except
a. Autoinfection is seen
b. Macrolides is the treatment of choice
c. Pulmonary involvement may occur
d. Ag detection in stool and direct fluorescence testing are alternative methods of detection

919. The best method to detect Strongyloides larvae is which of the following
a. Bearmann technique
b. Dilution followed by egg count
c. NIH swab
d. Sigmoidoscopy and aspiration of mucosal lesions

920. A teenager who works in a dog kennel after school has had a skin rash, eosinophilia and an enlarged liver and spleen for 2 years. Which of the following is the most likely cause of this infection?
a. Schistosomiasis
b. Toxoplasmosis
c. Trichinosis
d. Visceral Larva migrans

921. Onchocerciasis:
a. Is caused by a protozoan
b. Transmitted by the bite of fly
c. Is confined to the African continent
d. Ocular involvement results from lymphatic migration of the parasites

922. In Toxocariasis:
a. The infestation is acquired from both dogs and cats
b. Infestation occurs through ingestion of larvae
c. Intraocular calcification is a common feature of ocular toxocariasis
d. Steroid is contraindicated

923. A 30 year old patient presented with features of acute meningoencephalitis in the casualty. His CSF on wet mount microscopy revealed motile unicellular microorganisms. The most likely organism is
a. Naegleria fowleri
b. Acanthamoeba castellani
c. Entamoeba histolytica
d. Trypanosoma cruzi
e. Toxoplasma gondi

924. Winter bottoms sign in sleeping sickness refers to
a. Unilateral conjunctivitis
b. Posterior cervical lymphadenopathy
c. Narcolepsy
d. Transient erythema
e. Arthralgia

925. True about toxoplasmosis is all except
a. In adults toxoplasmosis is usually asymptomatic
b. IgG antibodies are diagnostic in congenital toxoplasmosis
c. Is a anthroponotic disease
d. Encephalitis is uncommon in immunocompetent individuals
e. The incidence of transplacental infection is highest in third trimester but the infant is not severely affected

926. The pathogenicity of Entamoeba histolytica is indicated by (PGI)
a. Zymodeme pattern
b. Size
c. Nuclear pattern
d. ELISA test
e. Haematophagus trophozoite

927. Giardiasis is associated with (PGI)
a. Common variable immunodeficiency
b. C1 esterase deficiency
c. C8 deficiency
d. Anaemia
e. Autosomal recessive agammaglobulinemia

917. c	918. b	919. a	920. d	921. b	922. a	923. a	924. b	925. b
926. a, e	927. a,e							

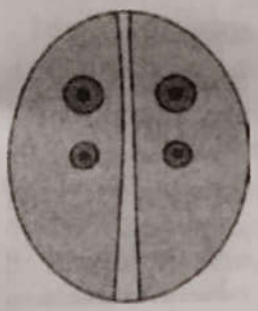
928. About acute primary amoebic meningoencephalitis true is?

a. Meningitis caused by Acanthamoeba species is acute in nature
b. Diagnosed by trophozoite in CSF
c. Caused by Feco-oral transmission
d. More common in tropical climate

929 True about amoebic colitis is: (PGI)

a. Caused by E. histolytica
b. Cyst contains 8 nuclei
c. Flask-shaped ulcers are present
d. Cecum is most commonly affected
e. Is premalignant

930. An anxious mother brought her 4-year-old daughter to the pediatrician. The girl was passing loose bulky stools for the past 20 days. This was often associated with pain in abdomen. The pediatrician suggested the stool examination, which showed the following organism. Identify the organism:



a. Entamoeba histolytica
b. Giardia lamblia
c. Cryptosporidium
d. E. coli

931. A patient present with diarrhea. Analysis of stool on wet mount shows mobile protozoa without RBCs and pus cells. The diagnosis is:

a. Balantidium Coli
b. Giardiasis
c. Trichomonas hominis
d. Entamoeba histolytica

932. All parasites cause encephalitis except:

a. Entamoeba histolytica
b. T. gondii
c. Angiostrongylus cantonensis
d. T. cruzi

933. Which of the following infestations leads to malabsorption?

a. Giardia lamblia
b. Ascaris lumbricoides
c. Necator americana
d. Ancylostoma duodenale

934. Visceral leishmaniasis: (PGI)

a. Caused by L. tropica
b. Post-leishmaniasis dermatitis is common
c. Antimonial are useful drugs
d. Diagnosed by blood smear
e. Vector is Phlebotomus sergentii

935. Mucocutaneous leishmaniasis is caused by:

a. L. braziliensis
b. L. tropica
c. L. donovani
d. L. orientalis

936. Which of the following is true about Giardia:

a. CFT is diagnostic
b. Trophozoites and cysts are seen in man
c. Lives in lower intestine
d. Invades normal mucosa

937. All of the following statements about toxoplasmosis are true except:

a. Oocyst in freshly passed cat's faces is not infective
b. May spread by organ transplantation
c. Maternal infection after 6 months has high risk of transmission
d. Arthralgia, sore throat and abdominal pain are the most common manifestation

938. Which of the following is true about P. falciparum?

a. James dots are seen
b. Accolé forms are seen
c. Relapse are frequent
d. Longest incubation period

928. b	929. a,c,d	930. b	931. b	932. c	933. a	934. c,d
935. a	936. b	937. d	938. b			

939. Toxoplasmosis in the fetus can be best confirmed by:

a. IgM antibodies against Toxoplasma in the mother
b. IgM antibodies against Toxoplasma in the fetus
c. IgG antibodies against Toxoplasma in the mother
d. IgG antibodies against Toxoplasma in the fetus

940. A 35-year-old male suffering from sudden onset of high-grade fever. On malarial slide examination all stages of parasites are seen with schizonts of 20 microns size with 14-20 merozoites per cell and yellow brown pigment. The diagnosis is

a. Plasmodium falciparum
b. Plasmodium vivax
c. Plasmodium malariae
d. Plasmodium ovale

941. True about toxoplasmosis: (PGI)

a. Due to ingestion of sporocyst with meat
b. Due to ingestion of oocyst from cat's faeces
c. Spiramycin given in pregnancy
d. Due to bite of Anopheles mosquito
e. Mostly symptomatic

942. Which is the infective stage for mosquito in case of *Plasmodium vivax:*

a. Gametocyte
b. Sporozoite
c. Zygote
d. Merozoite

943. About Microsporidia, all of the following are false except: (PGI)

a. It is a fungus
b. It is a protozoa
c. It is a bacteria
d. It is trematode
e. It is associated with diarrhea in HIV patients

944. Causative agent of malaria:

a. Protozoa b. Mosquito
c. Bacteria d. Virus

945. Protozoa associated with megaesophagus:

a. Trypanosome
b. Ameba
c. Giardia
d. Gnathostoma

946. Toxoplasma in children causes:

a. Chorioretinitis b. Conjunctivitis
c. Keratitis d. Papillitis

947. True about Giardiasis:

a. Only cyst is infective
b. Reside in caecum
c. Only man to man transmission
d. Exists in one phase

948. A traveler present with conjugated hyper-bilirubinemia and on investigations an egg was found in his biliary tract. Likely organism:

a. Clonorchis sinensis
b. Fasciola buski
c. Gnathostoma
d. Ascaris

949. Ingestion of raw fish leads to gallbladder cancer due to:

a. Clonorchis sinensis
b. Hymenolepis diminuta
c. Angiostrongylus
d. D. latum

950. Commonest parasite of CNS in India is:

a. Schistosomiasis
b. Cysticercosis
c. Trichinella spiralis
d. Hydatid cyst

951. Which of the following is the most-common location of intracranial neurocysticerosis?

a. Brain parenchyma
b. Subarachnoid space
c. Spinal cord
d. Orbit

939. b	940. b	941. b,c	942. a	943. b,e	944. a	945. a	946. a
947. a	948. a	949. a	950. b	951. a			

952. A child from Bihar comes with fever. Blood examination shows sheathed microfilaria with nuclei up to tail tip. The diagnosis is:

a. B. malayi
b. W. bancrofti
c. Loa loa
d. Onchocerca volvulus

953. Kalu, 30-year-old man, presented with subcutaneous itchy nodules over left iliac crest. On examination, they are firm, nontender, and mobile skin scrapings contain microfilaria and adult worms of:

a. Loa loa
b. Onchocerca volvulus
c. Brugia malayi
d. Mansonella perstans

954. Nematodes are differentiated from other worms by all except:

a. Absent fragmentation
b. Flat or fleshy leaf-like worms
c. Separate sexes
d. Cylindrical body
e. GIT is formed completely

955. Which of the following is not a neuroparasite?

a. Taenia solium
b. Acanthamoeba
c. Naegleria
d. Trichinella spiralis

956. Pigs are reservoir for: (PGI)

a. T. solium
b. T. saginata
c. Trichinella spiralis
d. Ancylostoma

957. Autoinfection is seen with:

a. Ankylostoma
b. Enterobius
c. Echinococcus
d. Ascariasis

958. All float in a saturated salt solution except:

a. Clonorchis sinensis
b. Fertilized eggs of ascaris
c. Larva of Strongyloides
d. Trichuris trichiura

959. Parasites causing lung infestation are: (PGI)

a. H. nana
b. Paragonimus westermanii
c. Taenia saginata
d. E. granulosus
e. E. multilocularis

960. Schistosomiasis is an example of:

a. Meta-zoonosis
b. Cyclo-zoonosis
c. Direct-zoonosis
d. Sporo-zoonoses

961. Cercariae are infective form of:

a. S. haematobium
b. P. westermanii
c. F. hepatica
d. T. solium

962. Wuchereria bancrofti, true is:

a. Unsheathed
b. Tail tip free from nuclei
c. Non-periodic
d. All

963. All cause malabsorption syndrome except:

a. Giardiasis
b. Ascaris
c. Strongyloides
d. Capillaria phillipinesis

964. Virus can be isolated from clinical samples by cultivation in the following except:

a. Tissue culture
b. Embryonated eggs
c. Animals
d. Chemically defined media

965. Prokaryotes are characterized by:

a. Absence of nuclear membrane
b. Presence of microvilli on its surface
c. Presence of smooth endoplasmic reticulum
d. All of the above

952. c	953. b	954. b	955. d	956. a,c	957. b	958. a	959. b,d,e
960. a	961. a	962. b	963. b	964. d	965. a		

883. B. Plasmodium falciparum

Plasmodium falciparum possesses a number of virulence factors and its pathogenesis is different from other species. Hence the disease is more acute and severe in nature with more complications than the benign malaria.

884. C. Unfertilized eggs of Ascaris

Fertilised eggs of Ascaris float in saturated salt solution.

885. A. Giardiasis

Giadia lamblia causes only gastrointestinal manifestations.

886. C. Isospora

Cryptosporidium, Cyclospora and Isospora are acid fast parasites that can cause opportunistic infections (diarrhea) in HIV infected patients.

887. D. Avidity testing must be done to differentiate between IgA & IgM

Congenital toxoplasmosis can be diagnosed by detecting: Toxoplasma antigens in amniotic fluid. Toxoplasma specific genes by PCR. IgM antibodies in fetal blood by ELISA or IFA. IgA antibodies in fetal blood. Double-sandwich IgA-ELISA is more sensitive than the IgM-ELISA. Isolation of the parasite by animal inoculation or tissue culture.

IgG antibodies can cross placenta, so it cannot differentiate congenital infection from maternal transfer. However, maternal IgG antibodies disappear after 6 months after birth. So, its persistence beyond 6 months after birth suggests congenital infection.Ultrasound of fetus at 20–24 weeks of gestation is useful for detecting the lesions ofcongenital infection.

888. B. Ascaris

Ascaris lumbricoides lives in the lumen of the gut, does not attach to the wall, and derives its sustenance from ingested food.

889. D. L. donovani

PKDL:

It is a nonulcerative lesion of skin, occurs in 2–50% of patients of VL following the completion of treatment.

Mainly seen in India and East African Countries.

It develops as hypopigmented macule (most common feature) near mouth which later on spreads to face and then to arms and trunk (extensor surfaces) and finally becomes nodules resembling leprosy.

Ocular lesions like conjunctivitis and uveitis are associated in some patients. Sometimes, PKDL occurs in subclinical patients without a history of VL.

890. A. Trichuris trichiura

Trichuris trichiura is oviparous, rest three options are viviparous.

891. A. Vertical Transmission

Mode of transmission of Entamoeba histolytica:

Feco-oral route (most common): By ingestion of contaminated food or water with mature quadrinucleated cysts.

Sexual contact: Rare, either by ano-genital or orogenital contact (especially in developed countries among homo sexual males).

Vector: Very rarely, flies and cock roaches may mechanically transmit the cysts from feces, and contaminate food and water.

892. B. Trypanosomiasis

T. cruzi passes its life cycle in two hosts—(1) humans and (2) vector reduviid bugs or kissing bugs or triatomine bugs.

T. brucei passes its life cycle in two hosts.

1. The **vertebrate host** is man and other animals

2. **Invertebrate host** is the **tsetse fly** (genus

Glossina). Both male and female flies bite man and serve as vectors.

Glossina palpalis group serves as the vector for T. brucei gambiense whereas Glossina morsitans group is the vector for T. brucei rhodesiense.

Reamaining three options are transmitted by mosquitoes.

893. B. Toxoplasmosis

Sabin-Feldman dye test:

This is the gold standard antibody detection method for toxoplasmosis, usually done in the reference laboratories.

Other serological tests are evaluated taking this test as standard.

894. A. Enterobius

Enterobius vermicularis is also called as pin worm or threadworm or seat worm.

895. C. Hard ticks

Babesia: The nymph stage of the deer tick Ixodes scapularis is the primary vector (definitive host) of the parasite. Occasionally it is transmitted by blood transfusion. Humans act as intermediate host.

Mode of transmission: Man acquires infection by the bite of ticks where the sporozoites enter through the site of bite and are discharged into circulation.

896. A. Toxoplasmosis

Manifestations of congenital toxoplasmosis include still birth, intracerebral calcification, psychomotor disturbance, microcephaly and hydrocephaly.

897. C. Cryptosporidium

Cryptosporidium, Cyclospora and Isospora are acid fast parasites that can cause opportunistic infections (diarrhea) in HIV infected patients.

898. A. Acanthamoeba

899. C. Except in infections with very high parasitaemia, only ring forms of early trophzoites and the gametocytes are seen in the peripheral blood.

Late trophozoite, early and mature schizonts — are not ordinarily seen in peripheral blood, except in very severe or pernicious malaria. The presence of P. falciparum schizonts in peripheral smears indicates a grave prognosis.

900. D. Giardiasis

Often Giardia intestinalis infections are asymptomatic, but in some cases, Giardia may lead to mucus diarrhea, fat malabsorption (steatorrhea), dull epigastric pain, and flatulence. The stool contains excess mucus and fat but no blood.

¾Children may develop chronic diarrhea, malabsorption of fat, vitamin A, protein, sugars like xylose disaccharides, weight loss, and spruelike syndrome.

901. C. Larval invasion does not occur in beef tape worm infection

902. A. Digestive tract and heart

In chronic phase, T. cruzi produces inflammatory response, cellular destruction, and fibrosis of muscles and nerves, that control tone of hollow organs like heart, esophagus, colon, etc. Thus, it can lead to cardiac **myopathy** and **megaesophagus** and **megacolon** (dilalation of esophagus and colon).

903. B. Direct fluorescent antibody microscopy

Diagnosis of P. jirovecii pneumonia is confirmed by histologlical identification of the parasite in sputum or brochoalveolar lavage (BAL), or tracheal aspirate. Specimens are stained by toludine blue, periodic acid-Schiff (PAS), Gomori methanamine silver (GMS), or immunofluorescence stains, which show characteristic cysts.

904. E. Trichomonas vaginalis

Trichomonas differs from other flagellates, as they exist only in trophozoite stage. Cystic stage is not seen.

905. B. Infection with fish tape worm

Infection by D. latum causes little damage in the small intestine. In some individuals, megaloblastic anemia occurs as a result of vitamin B12 deficiency caused by preferential uptake of the vitamin by the worm.

906. E. Strongyloides

In debilitated individuals and particularly in those with cellular immune defects, extensive internal reinfection takes place, leading to an enormous number of adult worms in the intestines and lungs and larvae in various tissues and organs. This is known as **hyperinfection**.

907. B. Bancroftian filariasis

Humans are infected with W.bancrofti when the **female mosquito** (especially Anopheles and Culex species) deposits infective larvae on the skin while biting.

908. C. Elisa
E Sigmoidoscopy and aspiration of mucosal lesions.

Elisa is used for diagnosis of extraintestinal amoebiasis.

Sigmoidoscopy is used for diagnosis of intestinal amoebiasis.

909. E. Vaginal secretions

Vaginal or urethral discharge is examined microscopically in saline wet mount preparation for characteristic jerky and twitching motility and shape of T.vaginalis trophozoites. In males, trophozoites may be found in urine or prostatic secretions.

910. A. Paragonimus westermanii

Paragonimus westermani, the lung fluke, causes paragonimiasis. Humans are infected by eating raw or undercooked **crab meat** (or crayfish) containing the encysted larvae (metacercariae).

911. A. Cerebrospinal fluid

The diagnosis of PAM is based on the finding of motile Naegleria trophozoites in wet mounts of freshly-obtained CSF.

912. B. Cerebral cysticercosis

Neurocysticerosis (cysticercosis of brain) is the most common and most serious form of cysticercosis. About 70% of adult-onset epilepsy is due to neurocysticercosis. Other clinical features of neurocysticercosis are increased intracranial tension, hydrocephalus, psychiatric disturbances, meningoencephalitis, transient paresis, behavioural disorders aphasia, and visual disturbances. It is considered as the second most common cause of intracranial space occupying lesion (ICSOL) after Tuberculosis in India.

913. B. Beef

Man acquires infection by ingesting raw or undercooked beef containing cysticerci.

914. D. The baby may be LBW

915. D. DNA PCR

Cyst and trophozoites of E. histolytica are indis tinguishable from that of E. dispar or E. moshkovskii except the presence of RBCs in trophozoites of E. histolytica (which might not be there after dysentery episode is over). So, the report should always be sent as "cyst or trophozoite of E. histolytica/ dispar/moshkovskii found in the stool microscopy."

Isoenzyme (zymodeme) analysis E. histolytica possesses several isoenzymes like malic enzyme, hexokinase, isomerase, and phosphoglucomutase.

When these isoenzymes are subjected to electrop horesis, based on the electrop horetic pattern (zymodeme pattern) and mobility of the isoenzymes, Entamoeba can be speciated .

It can also be used to differentiate E. histolytica and E. dispar.

However, zymodeme analysis has a number of disadvantages such as: difficulty of performing the test, timeconsuming and difficulty in preparing the antigens by culture.

Molecular diagnosis: Nested multiplex polymerase chain reaction (PCR) is available targeting small subunit ribosomal ribonucleic acid (rRNA) genes that can diff erentiate E.histolytica, E.dispar and E.moshkovskii with a sensitivity of nearing 90% and specificity of 90–100 % .

Realtime PCR can be used as alternate to the conventional PCR. It is more sensitive, quantitates the parasite load and takes less time with less contamination rates.

916. B. Except in infections with very high parasitemia only ring forms of the early trophozoites and the gametocytes are seen in the peripheral blood

Late trophozoite, early and mature schizonts – are not ordinarily seen in peripheral blood, except in very severe or pernicious malaria. The presence of P. falciparum schizonts in peripheral smears indicates a grave prognosis.

917. C. Patients without a spleen

Severe Babesia infections are seen in splenectomised people.

918. B. Macrolides is the treatment of choice

No chemotherapeutic agent effective against cryptosporidium has been identified, although nitazomamide or parmomycin may be partially effective in few patients with AIDS. Improvement in immune status with Antiretroviral therapy can lead to amelioration of cryptosporidiosis. Other treatment methods include supportive therapy with fluid, electrolytes, and nutrient replacement.

919. A. Bearmann technique

Stool may be concentrated by formol ether concentration method or Baermann's funnel gauze method and examined for larvae more efficiently. Baermann's test requires a special apparatus and relies on the principal that larva will actively migrate out of the feces on a wire mesh covered with several layers of gauge.

920. D. Visceral Larva migrans

Visceral Larva Migrans:

This condition is caused by the migration of larvae of **nonhuman species** of nematodes that infect by the oral route. The most common cause is the **dog ascarid**, *Toxocara canis* and less often the cat ascarid, *T. cati*. Visceral larva migrans may also be caused by *Anisakis*, which are large ascarid parasites of marine animals and also by *Gnathostoma spinigerum*, *Angiostrongylus cantonensis*.

Human nematodes like *A. lumbricoides* and *S. stercolaris* may produce visceral larva migrans, when they get lost in ectopic sites.

As **children** are more likely to swallow dirt, this condition is much more frequent in them.

Fever, hepatomegaly, pneumonitis, hyperglobulinaemia, and pica are the common findings.

Patients may develop neurological disturbances (**neural larva migrans**) and endophthalmitis (**ophthalmic larva migrans**).

Marked leukocytosis occurs with persistently high eosinophilia.

921. B. transmitted by the bite of fly

Definitive host: Humans are the only definitive host.

Intermediate hosts: Day-biting female black flies of the genus *Simulium* (black flies).

922. A. the infestation is acquired from both dogs and cats

Visceral Larva Migrans :This condition is caused by the migration of larvae of non-human species of nematodes that infect by the oral route.

Etiology: The most common cause is the dog ascarid, Toxocara canis and less often the cat ascarid, T. cati. Visceral larva migrans may also be caused by Anisakis, which are large ascarid parasites of marine animals and also by Gnathostoma spinigerum, Angiostrongylus cantonensis.

Human nematodes like A. lumbricoides and S. stercolaris may produce visceral larva migrans, when they get lost in ectopic sites.

Pathogenesis: When the infective eggs present in the soil contaminated by dog and cat feces are ingested, the larvae hatch in the small intestine, penetrate the gut wall, and migrate to the liver. They may remain there or migrate to other organs such as lungs, brain, or eyes. In humans they do not develop into adults, but induce granulomatous lesions, which cause local damage.

Clinical Features: Clinical manifestations depend on the sites affected and the degree and duration of infection. As children are more likely to swallow dirt, this condition is much more frequent in them. Fever, hepatomegaly, pneumonitis, hyperglobulinaemia, and pica are the common findings. Patients may develop neurological disturbances (neural larva migrans)

and endophthalmitis (ophthalmic larva migrans). Marked leukocytosis occurs with persistently high eosinophilia. Diagnosis Serological tests, such as passive hemagglutination, bentonite flocculation, microprecipitation, and more specifically, ELISA have been developed for the diagnosis of toxocariasis (visceral larva migrans).

Treatment: Diethylcarbamazine (DEC), 100 mg TDS for 3 weeks in an adult, kills the larva and arrest the disease. Thiabendazole may be useful in treatment. Prednisolone should be administered concurrently either topically or systemically. Prophylaxis: Deworming of household pets helps in prevention by limiting the contamination of soil.

923. A. Naegleria fowleri

Patients are mostly previously healthy young adults or children.

Infection comes from water containing the amoebae and usually follows swimming or diving in ponds.

The amoebae invade the nasal mucosa and pass through the olfactory nerve branches in the cribriform plate into the meninges, and brain to initiate an acute purulent meningitis and encephalitis, **called as primary amoebic meningo encephalitis (PAM)**.

The incubation period varies from 2 days to 2 weeks.

In the incubation period, the patient experiences anosmia.

The disease advances rapidly, causing fever, headache, vomiting, stiff neck, ataxia, seizure, and coma.

Cranial nerve palsies, especially of the third, fourth, and sixth nerves have also been documented.

The disease almost always ends fatally within a week (average 5 days).

924. B. Posterior cervical lymphadenopathy

T. brucei gambiense causes African trypanosomiasis (West African sleeping sickness).

The illness is **chronic** and can persist for many years.

There is an initial period of parasitemia, following which parasite is localized predominatly in the lymph nodes.

A **painless chancre** (trypanosomal chancre) appears on skin at the site of bite by tsetse fly, followed by intermittent fever, chills, rash, anemia, weight loss, and headache.

Systemic trypanosomiasis without central nervous system involvement is referred to as **stage I disease**. In this stage, there is hepatosplenomegaly and lymphadenopathy, particularly in the posterior cervical region **(Winterbottom's sign)**.

925. B. IgG antibodies are diagnostic in congenital toxoplasmosis

Refer to explanation to question 887.

926. A. Zymodeme pattern
E. Haematophagus trophozoite

Based on electrophoretic mobility of 6 isoenzymes (acetylglucosaminidase, aldolase, hexokinase, NADdiaphorase, peptidase and phosphoglucomutase), *E. histolytica* strains can be classified into at least 22 zymodemes. Of these only 9 are invasive and the rest are noninvasive commensals. The zymodemes show a geographical distribution. Even in endemic areas, nonpathogenic zyodemes are far more common than pathogenic ones, which account only about 10% of the total population. It has been proposed that pathogenic and non-pathogenic strains though morphologically identical may represent 2 distinct species—the pathogenic strains being *E. histolytica,* and the nonpathogenic strains reclassified as *E. dispar*. Trophozoites of *E. dispar* contain bacteria, but no RBCs.

927. A. Common variable immunodeficiency
E. Autosomal recessive agammaglobulinemia

Risk factors for giardiasis: Children are commonly affected. Other high-risk groups are elderly debilitated persons and patients with cystic fibrosis, poor hygiene, and immunodeficiency syndromes such as common variable hypoglobulinemia. However, association with acquired immunodeficiency syndrome (AIDS) patient is not been confirmed yet.

928. **B. Diagnosed by trophozoite in CSF**

The diagnosis of PAM is based on the finding of motile *Naegleria* trophozoites in wet mounts of freshly-obtained CSF.

929. **A. Caused by E. histolytica**
C. Flask-shaped ulcers are present
D. Cecum is most commonly affected

Amoebic ulcer is the typical lesion seen in intestinal amoebiasis .The ulcers are **multiple** and are confi ned to the colon, being most numerous in the **caecum** and next in the **sigmoidorectal region**. The intervening mucous membrane between the ulcers remains healthy.The typical amoebic ulcer is **flask-shaped** in cross section, with mouth and neck being narrow and base large and rounded.

930. **B. Giardia lamblia**

Often Giardia intestinalis infections are asymptomatic, but in some cases, *Giardia* may lead to mucus diarrhea, **fat malabsorption** (steatorrhea), dull epigastric pain, and flatulence. The stool contains excess mucus and fat but no blood.

Children may develop chronic diarrhea, malabsorption of fat, vitamin A, protein, sugars like xylose disaccharides, weight loss, and spruelike syndrome.

Cyst is the infective form of the parasite. The cyst is small and oval, measuring 12 µm x 8 µm andmis surrounded by a hyaline cyst wall.

Its internal structure includes 2 pairs of nuclei grouped at one end. A young cyst contains 1 pair of nuclei.

The axostyle lies diagnonally, forming a dividing line within cyst wall.

Remnants of the flagella and the sucking disc may be seen in the young cyst.

931. **B. Giardiasis**

Giardia intestinalis does not invade the intestinal wall deeper than mucosa or submucosa, so no blood or neutrophils are present in stools.

932. **C. Angiostrongylus cantonensis**

Angiostrongylus cantonensis causes chronic meningitis.

933. **A. Giardia lamblia**

Refer to explanation to question 930.

934. **C. Antimonial are useful drugs**
D. Diagnosed by blood smear

About 3–10% cases of patients of visceral leishmaniasis in endemic areas develop PKDL, about an year or 2 after recovery from the systemic illness.

Peripheral blood contains the amastigotes present inside circulating monocytes and less often in neutrophils, but the numbers are so scanty that a direct blood smear may not show them.

The standard treatment consists pentavalent antimonial compound, which is the drug of choice in most of the endemic regions of the world, but there is resistance to antimony in Bihar in India, where amphotericin-B-deoxycholate or miltefosine is preferred.

935. **A. L. braziliensis**

L. brazilensis complex causes both mucocutaneous leishmaniasis and cutaneous leishmaniasis.

L. braziliensis causes the most severe and destructive form of cutaneous lesion.

It involves the nose, mouth, and larynx.

The patient experiences a nodule at the site of sandfly bite with symptoms consistent with oriental sore.

Subsequent mucocutaneous involvement leads to nodules inside the nose, perforation of the nasal septum, and enlargement of the nose and lips (espundia).

If the larynx is involved, the voice changes as well.

Ulcerated lesions may lead to scarring and tissue destruction that can be disfiguring.

The disease occurs predominantly in Bolivia, Brazil, and Peru.

936. **B. Trophozoites and cysts are seen in man**

- Giardia is the only protozoan parasite found in the lumen of the human small intestine (duodenum and jejunum).
- Trophozoites are pearshaped, bilaterally symmetrical with 2 nuclei, 4 pairs of fl agella, and a ventral concave sucking disc. They exhibit motility resembling a 'falling leaf'.

- Ellipsoid cysts contain 4 nuclei with remnants of flagella.
- Infective form: Ellipsoid cysts.
- Clinical features: Mostly asymptomatic but in some cases may cause diarrhea, dull epigastric pain, and malabsorption. Stool contains excess mucus but no blood. It does not invade deeper into the intestine.
- Diagnosis: By microscopic demonstration of trophozoites or cysts in stool, enterotest, and serodiagnosis by ELISA (ProSpec T/Giardia antigen assay).
- Treatment: Metronidazole and tinidazole are the drugs of choice.

937. D. Arthralgia, sore throat and abdominal pain are the most common manifestation

Cats shed millions of oocysts per day in feces for about 2 weeks during the primary infection. The freshly passed oocyst is not infectious.

They undergo sporulation in the soil with formation of 2 sporocysts, each containing 4 sporozoites. The sporulated oocyst is infective.

Most human infections are asymptomatic.

Transplantation from infected donors is one of the modes of infection.

Congenital toxoplasmosis results when T. gondii is transmitted transplacentally from mother to fetus. The risk of fetal infection rises with progress of gestation; from 25%, when the mother acquires primary infection in first trimester to 65% in the third trimester. Conversely, the severity of fetal damage is highest, when infection is transmitted in early pregnancy.

938. B. Accolé forms are seen

Ring form of Plasmodium falciparum : The early ring form in the erythrocyte is very delicate and tiny, measuring only a sixth(1/6) of the red cell diameter.

Rings are often seen attached along the margin of the red cell, the so-called form appliqué or accole.

Binucleate rings (double chromatin) are common resembling stereo headphones in appearance. Several rings may be seen within a single erythrocyte.

In course of time, the rings become larger, about a third of the size of the red cell and may have 1 or 2 grains of pigment in its cytoplasm.

939. B. IgM antibodies against Toxoplasma in the fetus

Congenital toxoplasmosis can be diagnosed by detecting:

Toxoplasma antigens in amniotic fluid.

Toxoplasma specific genes by PCR.

IgM antibodies in fetal blood by ELISA or IFA.

IgA antibodies in fetal blood. Double-sandwich IgA-ELISA is more sensitive than the IgM-ELISA.

Isolation of the parasite by animal inoculation or tissue culture.

IgG antibodies can cross placenta, so it cannot differentiate congenital infection from maternal transfer. However, maternal IgG antibodies disappear after 6 months after birth. So, its persistence beyond 6 months after birth suggests congenital infection.

Ultrasound of fetus at 20–24 weeks of gestation is useful for detecting the lesions of congenital infection.

940. B. Plasmodium vivax

The appearance of malarial pigment varies, mostly it is brown black in color and numerous (except in P. vivax it is yellowish brown in color and in P. falciparum, it is few in number).

Number of merozoites per mature schizont varies:

P. vivax—12–24 number (average 16)

P. falciparum—18–24 number (average 20)

P. malariae – 6 – 12 number (average 8)

P. ovale – 8 – 12 number (average 8)

Forms seen in peripheral blood smear examination: Trophozoites (early and late), gametocytes and schizonts.

941. B. Due to ingestion of oocyst from cat's faeces

C. Spiramycin given in pregnancy

Humans acquire infection after:

Eating uncooked or undercooked infected meat, particularly lamb and pork containing tissue cysts.

Ingestion of mature oocysts through food, water, or fingers contaminated with cat faeces directly or indirectly.

Intrauterine infection from mother to foetus (congenital toxoplasmosis).

Blood transfusion or transplantation from infected donors.

Spipramycin is the DOC for toxoplasmosis in pregnancy.

942. A. Gametocyte

Gametocyte is the infective stage for mosquito and sporozoite is the infective stage for man.

943. B. It is a protozoa
E. It is associated with diarrhoea in HIV patients

Microsporidia are classified under **Phylum** Microspora.

They are minute, intracellular, Gram-positive, spore-forming protozoa.

They can cause wide range of illness in patients with HIV and other immunocompromised diseases.

In patients with AIDS Enterocytozoon bieneusi and Encephalitozoon intestinalis lead to protracted and debilitating diarrhoea in 10–40% of cases.

944. A. Protozoa

Malaria is caused by Plasmodium, a protozoan parasite.

945. A. Trypanosome

In chronic phase, T. cruzi produces inflammatory response, cellular destruction, and fibrosis of muscles and nerves, that control tone of hollow organs like heart, oesophagus, colon, etc.

Thus, it can lead to cardiac **myopathy** and **megaoesophagus** and **megacolon** (dilatation of oesophagus and colon).

946. A. Chorioretinitis

The manifestations of congenital toxoplasmosis include chorioretinitis, cerebral calcifications, convulsions, strabismus, deafness, blindness, mental retardation, microcephaly, and hydrocephalus.

A few children are born with manifestations of acute toxoplasmosis, which may include fever, jaundice, petechial rashes, microphthalmia, cataract, glaucoma, chorioretinitis, lymphadenopathy, hepatosplenomegaly, myocarditis, cerebral calcifications, and chorioretinitis.

947. A. Only cyst is infective

Man acquires infection by ingestion of quadrinucleated cysts in contaminated water and food.

948. A. Clonorchis sinensis

The adult worm may cause obstruction and blockage of the common bile duct leading to **cholangitis**.

Patients in the early stage have fever, epigastric pain, diarrhoea, and tender hepatomegaly.

This is followed by biliary colic, jaundice, and progressive liver enlargement.

Many infections are asymptomatic.

Chronic infection may result in **calculus formation**.

A few cases go on to **biliary cirrhosis** and **portal hypertension**.

Some patients with chronic clonorchiasis tend to become biliary carriers of typhoid bacilli.

Chronic infection has also been linked with **cholangiocarcinoma**.

949. A. Clonorchis sinensis

Please refer to explanation to question 948.

950. B. Cysticercosis

Neurocysticerosis (cysticercosis of brain) is the most common and most serious form of cysticercosis.

About 70% of adult-onset epilepsy is due to neurocysticercosis. Other clinical features of neuro cysticercosis are increased intracranial tension, hydrocephalus, psychiatric disturbances, meningoencephalitis, transient paresis, behavioural disorders aphasia, and visual disturbances.

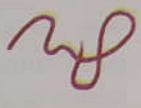
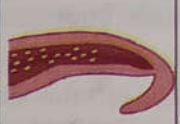
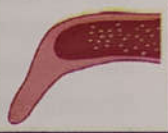
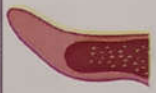
It is considered as the second most common cause of intracranial spaceoccupying lesion (ICSOL) after Tuberculosis in India.

It is the most common parasitic infection of brain in India.

951. A. Brain parenchyma

Parenchymal > intrventricular > subarachnoid space > spinal > orbital.

952. C Loa loa

Species	*Wuchereria bancrofti*	*Brugia malayi*	*Loa loa*	*Mansonella perstans*	*Mansonella ozzardi*	*Onchocerca volvulus*
Shape						
Posterior end						
Tail nuclei	Nuclei do not extend to the tip of tail	2 nuclei at the tip of the tail	Nuclei form continuous row in the tip of the tail	Nuclei extend to the tip of the tail	Nuclei do not extend to the tip of the tail	Nuclei do not extend to the tip of the tail
Anterior end						
Size	300 x 8 μm	220 x 6 μm	270 x 8 μm	180 x 4 μm	220 x 4 μm	200 x 360 μm
Sheathed/ unsheathed	Sheathed	Sheathed	Sheathed	Unsheathed	Unsheathed	Unsheathed
Habitat	Blood	Blood	Blood	Blood	Blood	Skin, eye

Head and tail ends of microfilariae found in humans

953. B. Onchocerca volvulus

The **subcutaneous** nodule or **onchocercoma** is a circumscribed, fi rm, non-tender tumor, formed as a result of fibroblastic reaction around the worms.

Nodules vary in size from a few mm to about 10 cm.

They tend to occur over anatomical sites where the bones are superficial, such as the scalp, scapulae, ribs, elbows, iliac crest, sacrum, and knees.

The nodules are painless and cause no trouble except for their unsightly appearance.

954. B. Flat or fleshy leaf-like worms

Nematodes are cylindrical, or filariform in shape, bilaterally symmetrical with a secondary **triradiate symmetry at the anterior end**.

The adults vary greatly in size, from about a millimetre (*Strongyloides stercoralis*) to a meter (*Dracunculis medinensis*) in length. Male is generally smaller than female and its posterior end is curved or coiled ventrally.

Their body is covered with a **tough outer cuticle**, which may be smooth, striated, bossed, or spiny.

The **middle** layer is hypodermis and the **inner layer** is the somatic muscular layer. They move by **sinuous flexion** of the body.

The body cavity is a **pseudocele**, in which all the viscera are suspended.

The digestive system is complete, consisting of a anteriorly placed mouth leading to the esophagus, which characteristically varies in shape and structure in different groups. The intestine is lined with a single layer of columnar cells and leads to the rectum, opening

through the anus. In the male, the rectum and the ejaculatory duct open into the **cloaca**.

Nematodes have simple excretory and nervous systems.

The nematodes are **diecious** i.e. the sexes are separate.

The male reproductive system consists of a single delicate tubule differentiated into testis, vas deferens, seminal vesicle, and ejaculatory duct, which opens into the cloaca. It also includes copulatory structures such as spicules or bursa or both.

The female reproductive system consists of the ovary, oviduct, seminal receptacle, uterus, and vagina.

Female nematodes may produce eggs (**oviparous**) or larvae (**viviparous**). Some lay eggs containing larvae, which immediately hatch out (**ovoviviparous**).

955. D. Trichinella spiralis

956. A. T. solium

C. Trichinella spiralis

Parasites with source of infection	
Pork	**Fish**
• Taenia solium	• Diphyllobothrium latum
• Trichinella spiralis	• Clonorchis sinensis
• Sarcocysts suihominis	• Metagonimus yokogawai
Beef	• Heterophyes spp.
• Taenia saginata	• Gnathostoma spp.
• Sarcocystis hominis	
• Toxoplasma gondii	

957. B. Enterobius

Parasites causing autoinfection:

Strongyloides stercoralis

H.nana

Enterobius vermicularis

Taenia solium

958. A. Clonorchis sinensis

Eggs of Clonorchis sinensis are broadly ovoid, 30 µm by 15 µm with a yellowish brown (bile-stained) shell.

It has an operculum at one pole and a small hook-like spine at the other .

Eggs do not float in saturated solution of common salt.

The eggs passed in feces contain the **ciliated miracidia**.

959. B. Paragonimus westermanii,
D. E. granulosus,
E. E. multilocularis

960. A. Meta-zoonosis

It is a zoonosis that requires both a vertebrate and an invertebrate host for completion of its life cycle.

961. A. S. hematobium

Humans are infected when the free-swimming, fork-tailed **cercariae** penetrate the skin .They differentiate to larvae (schistosomula), enter the blood, and are carried via the veins into the arterial circulation. Those that enter the superior mesenteric artery pass into the portal circulation and

reach the liver, where they mature into adult flukes. S. mansoni and S. japonicum adults migrate against the portal flow to reside in the mesenteric venules. S. haematobium adults reach the bladder veins through the venous plexus between the rectum and the bladder.

962. B. Tail tip free from nuclei

Please refer to explanation to question 952.

963. B. Ascaris

Ascaris is intra-luminal worm, it does not attach to gut cells , hence does not cause malabsorption.

964. D. Chemically defined media

Viruses are obligate intracellular infectious particles which do not grow in artificial media.

965. A. Absence of nuclear membrane

Characteristic	Prokaryotic Bacterial Cells	Eukaryotic Human Cells
DNA within a nuclear membrane	No	Yes
Mitotic division	No	Yes
DNA associated with histones	No	Yes
Chromosome number	One	More than one
Membrane-bound organelles, such as mitochondria and lysosomes	No	Yes
Size of ribosome	70S	80S
Cell wall containing peptidoglycan	Yes	No